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ABSTRACT

A number of concerns about literacy, literacy instruction, and appropriate directions for literacy programs in the United States are addressed in these conference proceedings. Following an overview of the conference, the proceedings are divided into four sections and an introduction is provided for each section. The first section, "Perspectives on the Definition of Literacy," includes discussions on the difficulty of defining literacy. The second section, "Perspectives on Language and Cognition," contains articles on children's functional language and reading, the relationship between language and literacy, and written communication as functional literacy. The third section, "Perspectives on Reading," contains articles on theory and research on reading assessment and on relating theory and research to reading instruction. The fourth section, "Perspectives on Writing," has articles on a taxonomy of compositional competencies and sources of knowledge about literacy. (MKM)

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PERSPECTIVES ON LITERACY

Proceedings of the 1977
Perspectives on Literacy Conference

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Richard Beach
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CONFERENCE OVERVIEW

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The literacy of America's citizens, especially its youth, has received much attention in our newspapers, professional journals, legislative halls, and community meetings. Colleges complain that students cannot write, secondary schools complain that students cannot read, elementary schools complain that students lack appropriate experiences, and parents complain that schools are not doing their job.

The debates rage. "Are verbal abilities on the decline?" "Do schools need to move back to the basics?" "Are literacy skills as essential in modern society as we once thought they were?" Unfortunately, the debates seem to be characterized by rhetoric rather than logic, by intuitions rather than evidence, by slogans rather than scholarship. It is time to marshal whatever scholarly resources are available to take a hard look at the literacy issue and to establish a framework for solving whatever problems actually exist.

The Minnesota Perspectives on Literacy Conference was committed to such an examination. The purpose of this conference was to provide educators with current scholarly perspectives on the nature of literacy, problems of assessing literacy, social scientific perspectives regarding literacy, and appropriate directions for educators to consider in developing literacy programs. Rather than provide practical remedies for reading and writing instruction, it was hoped that the conference would articulate those theoretical and research perspectives that would be useful for understanding literacy problems and conceptualizing literacy programs.

Literacy involves more than the ability to read or write. It encompasses various language abilities that constitute reading and writing skills. A number of different scholarly fields--educational psychology, sociolinguistics, psycholinguistics, cognitive psychology, anthropology, rhetoric, speech--each provides its own unique perspective on the nature of these language abilities.

A composite of perspectives should also help educators evaluate the validity or invalidity of arguments in the current debates about literacy. While some argue that students should be instructed in grammatical rules and minute reading skills, others argue that such instruction interferes with students' engagement in communication processes. Evaluating these or other arguments requires some understanding of several issues: (a) methods for defining and measuring reading and writing skills, (b) individual differences in language development, as related to learning style, socialization, or cognitive development, and (c) methods for assessing the effects of different instructional influences. Without fresh, scholarly insights on literacy instruction, educators may continue to opt for untested or unsound instructional models, methods, and materials.

Scholars from various disciplines were invited to prepare papers representing present and possible contributions of their own fields on various facets of literacy. The four general topics were: (a) defining and assessing literacy, (b) language perspectives on literacy, including linguistic development, cognitive development, and sociocultural perspectives, (c) theory and research on the writing process and writing instruction, and (d) theory and research on the reading process and reading instruction.

The Conference Proceedings and Current Concerns about Literacy

The conference proceedings address a number of concerns about literacy and literacy instruction in America. In order to place these proceedings into a historical context, we briefly outline a number of these concerns and some of the economic, social, and political forces or phenomena generating them.

A major influence on literacy instruction is the economic insecurity of the seventies. In a period of relatively high unemployment and inflation, there is much concern about whether high school and college students will get jobs. The fact that many may have difficulty in finding jobs results in much blame, not on the difficulties inherent in the economy, but on the schools, which, it is reasoned, should be preparing students for jobs. From this pragmatic, vocational conception of education, it is assumed that the ability to function in the world of work consists of a set of easily definable literacy skills which can be taught in schools. The limitation of such seemingly plausible and appealing arguments is their simplistic conceptions of how people develop in their use and understanding of language in both the worlds of work and school. Such simplistic conceptions will prevail unless discussions about literacy incorporate current theory and research on the complex processes of literacy development.

Rising inflation and the costs of schooling have resulted in another force--the demand that schools be held accountable for achieving certain objectives. In response to these demands for accountability, educators often fall back on statements of objectives (minimum competencies, "essential learner outcomes") that are limited to those literacy skills that can be assessed by using standardized tests. As a result, the test makers' conceptions of literacy skills ("inferring the main idea," "ability to identify a topic sentence") ultimately dictate the content of the curriculum.

The increasing use of tests poses a number of concerns. Are these tests valid measures of what they purport to measure? Are the test makers' conceptions of various processes of reading, writing, or language development consistent with current research findings? How are the test results interpreted or used? Answers to these questions require more than a discussion of test construction. They must also encompass an analysis of the theory and research that inform these tests.

It is not simply schools per se that are being held accountable. As teachers have gained increased financial status and autonomy through collective bargaining, they themselves are being held accountable by both administrators and the public for the nature and amount of learning in their classrooms. In order to demonstrate the effectiveness of new teaching techniques or to document growth using various assessment procedures, teachers need to be able to conduct their own research or assessment.

Unfortunately, many teachers are not aware of current theory and research in literacy education. In addition, they need some minimal tools for conducting research. For example, many English teachers have never had a composition methods course in which they might learn about such research. It is therefore important that teachers be exposed to discussions about theory and research in literacy; without some exposure, traditional ideas and practices persist.

At the same time, the public must support research efforts or a vicious cycle will ensue. Educators will be unable to demonstrate their competence to a skeptical public that refuses to provide funds for research for such a demonstration.

In recent debates over the supposed decline in literacy, the blame has been laid not only on schooling, but also on our cultural behavior. For example, it is argued that an increase in the amount of television viewing or an emphasis on oral rather than written exchange results in a decline in reading or writing abilities. While such arguments may be valid, they are plagued by the simplistic distinctions between reading and writing on the one hand and viewing and social discourse on the other. Certain language and cognitive processes cut across reading, writing, viewing, or speech; the ability to make inferences in a speech context carries over to inferences in reading; the development of schema for understanding logical or narrative relationships underlies inferences in all language experiences. This is not to deny that certain experiences allow for the development of certain thought or language processes more readily than other experiences. Writing, for example, may require more rethinking and conceptual organizing than speaking.

In order to understand a child's total experience with and development in various types of discourse, a newer theoretical perspective is needed, one that defines processes that could be studied in developmental research. This developmental research is needed to provide some empirical grounding for current theory of language arts instruction as espoused at the Dartmouth and York conferences, and by such theorists as James Britton and James Moffett. This theory questions the notion of language arts as either a set of utilitarian skills or a body of knowledge; it posits a developmental perspective of language that favors extensive experiences in using language rather than studying about language, in articulating responses to literature rather than studying literary history, and writing and reading others' writing rather than studying grammar rules or the rules constituting "good writing."

However, one of the problems with much of this theory, as John Dixon (1975) repeatedly noted in his report on the Dartmouth Conference, is that the theorist has little empirical understanding of what it is that students learn from such language experiences. When this current theory has been put into practice, it has therefore been difficult to demonstrate the validity of claims for these more innovative methods. Moreover, because teachers do not possess the methods or tools for assessing growth consistent with a developmental theory, they fall back on testing for skill acquisition or knowledge. Faced with the difficulties of implementing this theory into practice, many teachers have opted for more traditional methods of instruction.

In order to demonstrate the value of innovative methods based on a developmental or process-oriented language arts curriculum theory, educators need to devise measures that are consistent with the assumptions behind this theory. As some of the papers here suggest, the first step of defining the processes or behaviors associated with literacy is difficult enough; developing appropriate and valid measures is even more difficult. Once these measures have been developed, researchers would examine the relationships between various instruction techniques, stimuli, activities, or environments and learning outcomes.

While a number of papers touch on the latter, most of them deal with the problem of defining those processes or behaviors that contribute to the development of literacy and how, if possible, these processes or behaviors may be measured.

Central Themes of the Conference Papers

Meaning varies according to the context in which a word or concept is used. Attempting to define literacy is no exception: the meaning of literacy varies considerably according to the particular scholarly field in which it is discussed.

A number of the papers thus grapple with a definition of literacy. They suggest that the concept of literacy needs to be defined according to those behaviors in actual communicative contexts. Given the variation in auditors' or readers' cognitive or language development, their purposes for communicating, the discourse conventions constituting the contexts, and the larger social, economic, and cultural values dictating discourse behavior, it is difficult to establish absolute standards for defining and assessing literacy.

Research on literacy therefore needs to define and study a wide range of variables that impinge on the central act of communication. Research on clarity or readability of that which is being communicated needs to examine how auditors or readers at different developmental levels are processing explicit and implicit meanings. Such research would be helpful for the speaker or writer in considering his or her audience's potential comprehension processes.

Research needs to examine developmental differences in the speaker/writer's and auditor/reader's role-taking ability--their ability to internalize each other's perspectives in the act of communicating. Research needs to consider the ability of the communicator to vary the use of--or to understand differences in--modes of discourse (expository, persuasive, expressive, narrative), differences in intentions, differences in the situational or genre conventions constituting the context (formal ceremonial contexts, verbal games, literary conventions), and the stage of the message development (formulating, inventing, expressing, revising, reflecting, editing).

The papers also suggest that conceptions of literacy and literacy instruction have often been dictated by economic and cultural forces. These forces assume that literacy consists of those skills necessary for success in the world of work. It is further assumed that students needed extensive remediation in the rules of "correct" grammar or usage in order to use language in appropriate ways. This highly functional conception of literacy instruction may limit rather than encourage language development.

Literacy instruction has also assumed that having a theoretical knowledge about language ("knowing-that" competence) will enhance one's ability to use language ("knowing-how" competence). Some of the papers express doubt that instruction in grammar or composition rules will directly benefit writing or language development; other papers suggest that such a conclusion requires further analysis. It is also argued that emphasis on formal instruction about language often does not give students the opportunity to use language in a variety of actual discourse contexts. The writers express concern that narrow conceptions of literacy result in instruction on isolated language experiences that require students to integrate various language processes. Unfortunately, there is little solid applied research on the effectiveness of certain specific methods of literacy instruction.

The papers furthermore suggest that despite the fact that research on literacy instruction has been conducted since the turn of the century, much of that research has been piecemeal, nontheoretical, and narrow in scope. Because it was assumed that educational research could provide immediate answers or assumptions to problems in instruction, researchers often did not conduct basic research on the processes of reading, writing, or language use. As we gain further understanding of the complexity of these various problems, the measures or tests employed in this research should be a more valid measure of literacy skills.

A number of the papers express concern that research findings or test results are often of little use to administrators or teachers. Researchers and test makers should therefore interpret results so that they will be useful for educators; they should also communicate to educators and the public exactly what it is that certain tests are measuring.

Given the developmental orientation running through many of the papers, a major implication for improving literacy instruction is the need for descriptive criteria and assessment procedures for charting the individual student's growth in literacy skills. Teachers should be able to develop their own informal diagnostic or assessment procedures and be able to perceive behaviors in a classroom that represent different developmental levels.

The increased attention to writing research and instruction is a major theme of these proceedings. The traditional goal of writing instruction--to prepare students to write correctly according to the dictates of a limited set of arbitrary rules--is redefined so that writing is conceived as vital to the development of various language and thought processes. Instead of simplistic or "globalistic" conceptions of writing (to use James Britton's term), these papers suggest that writing behavior varies considerably according to discourse type, purpose, audience, and intended effect. Understanding these processes will require much careful research and more valid measures than those presently employed. The relationships between development in writing and development in reading and speech should also be studied in order to determine the larger developmental function of writing.

A number of the papers were critical of the tendency to chastize the schools for failing to provide effective literacy instruction. They argue that schools differ considerably in their effectiveness; citing research, they note that school programs characterized by a well-defined policy, effective leadership, the presence of extra personnel, allocation of sufficient resources, individualization, increased instructional time, and positive attitudes toward students result in higher literacy test scores than schools lacking these characteristics. It is interesting that many of these emphases are being curtailed due to lack of financial support.

In his synopsis of the conference proceedings, Gene Piché discusses the current "back-to-the-basics" movement in the context of how educational policy is shaped by economic and cultural forces. Piché notes that current conceptions of literacy instruction reflect some of the same economic and cultural forces prevalent in the last two decades of the nineteenth century. Given the need for educating an immigrant proletariat for jobs in a white-collar work force, educators emphasized instruction in standards of usage, "correct" grammar, and rules for composition. Language arts then became largely a matter of remediation of language use. Piché contrasts this highly limited conception with the notion of language arts as functioning in a developmental role. Rather than simply a means to societal ends, reading and writing are conceived of as helping students to develop various thinking processes. This implies a need for research on how writing and reading activities in various discourse modes result in the development of literacy.

Reference

Dixon, J. Growth through English. London: Oxford University Press, 1975

Perspectives on the Definition of Literacy

INTRODUCTION

John Bormuth's paper represents a provocative beginning to the conference because of his unique econometric perspective. First, he sets out to establish the fact that indeed a literacy problem exists. Second, he examines a particular definition of literacy on which his literacy model is based. Third, he develops his econometric model to account for the major determinants of a society's literacy: reading ability, comprehensibility of materials, the number of people who read anything, and the number of materials each reads. Fourth, he develops a rationale for evaluating literacy policies using his model rather than alternative models. And finally, he explores consequences of an overemphasis either on reading or writing instruction.

Taking analogues from classical economic theory's isocost and budget curves, Bormuth establishes budget and isoliteracy curves, curves representing these combinations of reading ability of readers and comprehensibility of materials that will yield various levels of literacy. Then he points out the various consequences that will arise if we choose one or another set of combinations of ability and materials. The assumptions in his analyses are intriguing: we can improve society's literacy by spending more resources on reading instruction and hence making readers better able to understand any given text, or we can spend more money on improving the skills of society's writers and hence make materials in general more comprehensible.

While Bormuth's approach to the literacy issue is unique for most educators, educational policymakers should find the approach both relevant and fascinating.

Richard Venezky's paper directs itself to the conflict between rhetorical and practical views of literacy. He rightly points out that rhetorical views of literacy have been with us for several generations and are likely to remain with us; that is, in each generation someone stands up to announce that literacy scores are on a decline and that we need to marshal all available resources to stop this devastating march. From a practical point of view, however, he raises doubts that the statistical decline in verbal ability scores carries with it any educational significance.

The focus of Venezky's paper is not in the issue of literacy instruction and literacy accomplishments in and of themselves; rather it is on the continuing inequality of literacy instruction and literacy accomplishments between disadvantaged and advantaged students in this country. Having pointed out the inequality in literacy instruction in accomplishments, Venezky offers some evidence to show that the reading scores of the disadvantaged--in particular, the urban poor--can be improved without a revolution in literacy instruction and without unreasonable investments of resources. Indeed, Venezky offers some specific examples of inner-city schools that seem to be helping their disadvantaged students.

Rexford Brown's reaction to the papers by Bormuth and Venezky provides another focus. Addressing himself primarily to issues raised by Bormuth, Brown essentially agrees with Bormuth that there needs to be a more equitable balance between reading and writing instruction in this country. Yet where Bormuth regards this balance as the necessary consequence of economic forces and costs, Brown sees it as necessary on logical and ethical grounds. The danger in overemphasizing reading at the expense of writing is, to use his words, that we may produce "people who send and receive on a very narrow band of the language spectrum--a nation of reading and writing CBers who don't know about the AMs and FMs of language, let alone the radars that poets play with." In short, he finds that the overemphasis on reading in the past decade or two has produced more students who can read but fewer students who can read well. Implicit in this argument is the assumption that a greater allocation of resources to writing instruction will not only make better writers but also better readers.

Jack Merwin, in contrast to Brown, responds to the papers of Bormuth and Venezky with a more technical focus. For example, in looking at Bormuth's paper, Merwin asks first for a clear definition of literacy. Second, he questions whether or not the literacy of individuals is additive--that is, can one sum the literacy of an adult author and that of a 4-year-old child? Third, he asks who determines what a person ought to be able to read and write. Fourth, he asks for a definition of what Bormuth refers to as "a material"--is it a sentence, a paragraph, a book? Venezky's paper, thinks Merwin, is tied too specifically to the reading aspect of literacy--pointing out that the reading side of the literacy issue has consistently attracted more attention than the writing side.

Merwin also argues that Venezky's consideration of literacy is limited to functional skill development and asks where functional literacy ends and "more advanced" literacy begins. Finally, he points out that the issues are complex and not easily resolved but that they represent challenges that need to be systematically addressed by the profession.

In response to the issues raised by Merwin, Bormuth answers each of Merwin's questions by clarifying his own position.

LITERACY POLICY AND READING AND WRITING INSTRUCTION

John R. Bormuth
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Anyone who has been alive or even moderately alert for a couple of decades knows that society is periodically convulsed by literacy crises. In a cynic's view, these crises begin with some flimsy evidence purporting to show that people cannot read and write as well or as much as they ought and then develop into confused competitions over who gets to claim the blame and the spoils that go with it. Publishers, mindful of how government subsidies can increase profits, point out that people would read more if the prices of materials could be lowered. Librarians and booksellers, aware of their own incomes, join the chorus by pointing out that they could also make materials cheaper and more convenient for people to use. English teachers, who are in chronic oversupply, then weigh in with the observation that people could learn to write more comprehensibly than they do. And reading teachers, with visions of higher salaries and larger reading clinics, rend the public's heart with accounts of all the little children who cannot recognize printed words, much less comprehend what those words say. The public, despairing of making sense of the conflicting claims, then seeks an obvious scapegoat on whose head it heaps scorn and tax moneys, and then forgets the matter only to discover a few years later that all we accomplished was to increase the costs of literacy a lot and the level of literacy very little. As we all know, reading instruction usually claims the prize, although publishers do have their second- and fourth-class mail subsidies and library incomes have outgrown not only inflation but also the population.[1]

A cynic's view, however, has a way of being both right and wrong. This one is certainly correct in pointing out

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[1] Data appearing in R. R. Bowker's Directory of American Libraries show that the total incomes of public libraries in the United States rose, in terms of 1976 dollars, from \$2.47 to \$4.36 per person, at a compound annual rate of 2.3 percent, between 1950 and 1975.

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that literacy policies are not formulated and evaluated in a thoroughly rational and comprehensive manner. But it is wrong to demonize the protagonists in these debates. For one thing, the public is not a naive flock of sheep that can be easily hoodwinked into believing that there is a problem when none really exists. Generally, each individual knows whether he and those around him can use the written word as well as they ought. And few have to be told that the modern means of producing our material necessities and cultural enjoyments depend as much on the information as on the labor and raw materials used in those processes or that the written word is essential for conveying much of that information. Moreover, the protagonists in these debates are about as selfless as any group is likely to be. The onus and the rewards have fallen to reading teachers, not because they are more devious and clever, but merely because the logic of their case is more direct and obvious. The worst that could be said of either the public or the protagonists is that they hold a rather simplistic view of the nature of literacy. But they can hardly be blamed for that, since literacy is produced by a variety of private and government institutions that are related in subtle and complex ways. And no one has yet proposed a comprehensive way in which we could model that program and then formulate and evaluate the policies that govern it.

The purpose of this paper is to present such a model and then to demonstrate its use by showing that achieving and increasing literacy efficiently depends on our maintaining a proper balance among several activities. Particular attention will be given to the balance between reading and writing instruction and to showing that an overemphasis on either leaves us just as poor and a lot less literate than we could have been.

First, we will assure ourselves that there really is a literacy problem and that it is an important one. Next, we will examine the definition of literacy on which the model is based. Third, we will develop this model in a way that accounts for the four major determinants of the society's literacy, namely, the level of people's reading ability, the comprehensibility or clarity of the materials people read, the number of people who read anything, and the number of materials that each person reads. Fourth, we will examine the basic logic for evaluating policies that are formulated using a model of this sort. And, finally, we will explore some of the major consequences of overemphasizing either reading or writing instruction.

Extent and Importance of the Literacy Problem

Introductions to discussions of literacy policy have generally been implausible and probably counterproductive. Good rhetorical form dictates that they begin by establishing a pressing need to attend to this subject, in particular that people are not as literate as they ought to be and that the situation is taking a fearsome toll. But then the authors, lacking solid evidence on these matters, cite evidence that shakes the reader's faith--evidence that at best suggests that we do not really know if most people are as literate as they ought to be and that, if some are not, whether they are really just a small number of unfortunates for whom literacy is the least of their problems. Hence, only the readers who are already convinced can hold onto their initial beliefs; the intelligent and honestly concerned are driven to skepticism; and the skeptics are made more skeptical. Since better evidence is now becoming available, let me briefly indicate its nature and try at the same time to regain some of our lost credibility by setting the newer evidence in contrast with the old.

Status of Literacy

At first glance, the evidence customarily presented on the state of people's literacy does appear alarming. First, in its most recent survey, the Bureau of the Census (1969) found that 1.4 million people over the age of 14, or 1 percent, are illiterate in the sense that they can neither read nor write simple messages in any language. Second, almost half of the students in the United States score below their grade-level expectancy on reading achievement tests (Allen, 1969). Third, students' scores on these tests seem to have been declining a bit during the past decade (Farr & Tuinman, 1974). And, finally, large numbers of college students do not seem to write as well as some of their professors would like to have them write (Lyons, 1976).

The use of these statistics has been criticized on a number of points (Bormuth, 1974; Powell, 1975), the most important being these:

1. The fact that 1 percent of the adult population is unable to read and write simple messages is hardly alarming since about that many people are also severely impaired neurologically, visually, or intellectually. But we cannot then conclude that nearly everyone realistically capable of achieving literacy is doing so. Illiteracy refers to no useful ability to read and write, while literacy normally

implies as much ability as is realistically desirable. Between those two amounts of ability lies a broad gray belt that, for all the census data tell us, may contain all or none of the remaining 99 percent of the population. Nor is it very enlightening to be told that about half of the school children score below their respective grade-level expectancies, since that is exactly equivalent to saying that half of their scores fall below the average score of students at their grade level and that half would remain below that point even if all were miraculously to become perfectly literate.

2. The fact that students' scores on reading tests may have fallen a bit is only marginally relevant for assessing their literacy, since their literacy also depends on the complexity of the materials they ought to read. For all this statistic tells us, the students may or may not have enough skill to deal with materials that complex.

3. Being told that college students do not write well enough to please their professors begs the central issue--that is, whether those students write well enough to convey the information they should to the people for whom they will ultimately want and need to write. So, whether people are or are not as literate as they ought to be cannot be determined from the evidence most commonly cited on this matter.

Some direct and modestly plausible evidence has become available on the matter. One pair of studies (Bormuth, 1968; Hansen & Hesse, 1974) showed that over 30 percent of the high school seniors could obtain little or no information either from the average textbook used in their instruction or the average news article. Another study (Louis Harris & Associates, 1970) found that over 18 percent of the adults in the United States incorrectly filled over 10 percent of their blanks in some forms that were more or less similar to those used for personal identification and for applying for personal loans, drivers' licenses, public welfare, and Medicaid. And a fourth study (Sticht, 1975) indicated that a substantial number of soldiers cannot obtain much of the information contained in the materials they would have to read in order to perform fairly common military occupations, such as that of cook and light weapons infantryman. These studies are especially significant by virtue of the fact that they employed materials that were of practical significance to the people being tested. Thus, they demonstrated not only that many of these readers were illiterate with respect to materials they actually wanted or needed to read but also that the writers of these materials were illiterate with respect to many of the readers for whom they actually wanted or needed to write. Thus, we can legitimately conclude that many people are not as literate as they ought to be.

Consequences

The evidence commonly cited to demonstrate the significance of the literacy problem has often been less than convincing. It consists of such findings as that the inhabitants of our jails are poor readers (Allen, 1969), that those who read the least earn the least and occupy poorer-than-average housing (Sharon, 1972), and that many poor and elderly people need help in filling out their applications for welfare and Medicaid assistance (Louis Harris & Associates, 1970). Now these matters certainly do merit attention of some sort. But they raise serious questions about what kind of attention is required most and whether literacy is of much really fundamental importance. To begin with, did people wind up in jail or poor because they did not learn to read well, or were their poor circumstances the result of low intelligence, unwillingness to apply themselves, or location in a destructive social environment? Would these people profit most from increased instruction in literacy skills in view of the army of public employees hired to help people fill out forms, or do they have more pressing needs for which the money should be spent? And finally, these statistics suggest that the literacy problem is entirely confined to a small fraction of the population. Thus, arguments for the significance of the literacy problem have generally boiled down to a plea for massive expenditures to help a pathetic but small number of people attain some skills that they may or may not want or need.

We can begin to estimate the full magnitude of the literacy problem if we examine a survey of adult reading habits conducted in 1971 (Sharon, 1972). It was found that the mean amount of time an adult spent reading was 166 minutes (median = 106 minutes), or 2 hours and 46 minutes per day and one-sixth of his 16 waking hours. A substantial fraction of this reading was done in direct support of work, shopping, traveling, recreation, and virtually every other human activity. The time spent reading at work was especially interesting since I could use this figure to obtain at least a very conservative estimate of the monetary value that is placed on reading and the extent to which reading contributes to our basic material welfare. The mean amount of time that gainfully employed people spent reading on their jobs was 141.1 minutes (median = 61 minutes) or 29.4 percent of an 8-hour working day. When we take this fraction of the nation's total income for that year, which was $859.4 billion, we find that employers thought that these people's reading activities on their jobs was worth at least $252.6 billion ($347 billion in 1976 dollars) or about one-fourth of the gross national product for 1971. Thus, we can say that at least one-fourth of the value of all the goods and services produced annually is contributed by reading.[2]

Since one-fourth of our material wealth and large fractions of our other essential needs as well as our wants depend directly on our reading activities, we can conclude that literacy is one of our most extensive and basic activities. And then, since over a third of the students graduating from our high schools can obtain virtually no information from the average textbook, news article, and other materials they need or want to read competently, we can plausibly conclude that we have a literacy problem of almost heroic dimensions. And finally, we can conclude that we ought to be giving very serious attention to how we go about formulating literacy policy.

Nature of Literacy

The first step in developing a model of the literacy program is to decide exactly what it is that that program is supposed to produce, namely, literacy. This is by no means a trivial problem, since people use that term to refer to many different things and each user tends to be a bit jealous of his own definition. Rather than join the battle for ownership of this word, let us simply stipulate the meaning that is most convenient for our present purposes and then briefly examine its relationship to the general meaning of the term. For our present purposes, we will speak of the volume of literacy and will let that term refer to the total amount of information[3] that people exchange through the materials they want or need to use.

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[2] This figure barely begins to account for either the costs or benefits of literacy. Consider, as examples, the moneys spent for instruction in literacy skills, libraries, mail and telegraph services, and printed matter, not to mention the value of the time people spend reading and writing while not gainfully employed.

Direct vs. Indirect References

In order to achieve literacy, people must engage in four activities: learning how to read, learning how to write, manufacturing materials, and distributing those materials to their readers. The people who conduct and supervise these activities often use the term literacy to refer to the end product of their particular activity--teachers to refer to the amount of reading or writing skill they impart to a student, publishers to the volume of materials that they manufacture, and librarians and booksellers to the amount of material that people buy or borrow. However, these are merely synecdochic usages of the term, for each is actually a partial determinant of literacy rather than being literacy itself. Other things being equal, each partial determinant would provide a reasonably good indicator of literacy, but no single one of them is literacy itself. That is, a person cannot be literate in any meaningful sense unless he has at least some reading skill, unless someone has achieved at least some writing skill, unless at least some materials have been produced, and unless he can get at least some of those materials. Changing the level of any one of these variables changes the extent of his literacy. Thus, literacy refers directly to the actual exchange of information that takes place when a person reads a material. And the amount of information that is exchanged at that point counts as a direct and simultaneous measure of the literacy of both the reader and the writer who produced that material. Thus, our present definition of literacy refers directly to literacy itself.

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[3] Information comes in many forms: true and false, good and bad, explicit and implicit, aesthetic and mundane, and so on. Curriculum workers need to pay close attention to these distinctions since a different kind of skill is required for a person to obtain each kind of information. Those who make the major decisions about literacy policy are interested chiefly in the end product of the literacy program--the information that is exchanged--and are only secondarily concerned with the extremely technical matters dealing with the kinds of mental processes by which people deal with these various kinds of information.

Reading-Writing Literacy

For many purposes it is useful to distinguish between people's reading and writing literacy, for these two aspects of literacy require the use of different and somewhat independently learned skills that function differently in the system of activities that produce literacy. However, the level of people's literacy is determined jointly by the two and not by either one alone. That is, a society could exchange a given amount of information and thereby reach that given level of literacy having only fairly primitive reading skills provided that the writers who prepared the society's materials were highly skilled at their craft. Conversely, people could reach that same level of literacy if their writers were much less skilled provided that they possessed a fairly high level of reading skill. For policy purposes, however, the levels of people's reading and writing skills represent second-order issues. What literacy is all about, what we are seeking and paying for in a literacy program, is that exchange of information. The specific skills needed to get as much literacy as we want is an important but strictly secondary technical issue. Thus, the definition stipulated here makes no distinction between reading and writing literacy since it refers to neither reading nor writing skills but strictly to the amount of information exchanged from writers to readers.

Specific-General

The term literacy can be used to refer to phenomena at any of several levels of generality of either people or materials. It may be used to denote the extent to which a single reader is able to comprehend a single material, some specialized type of material (as is the case with the term functional literacy), or all the different materials he might want or need to read. Similarly, it may be used to denote the extent to which a writer is able to communicate information to a single reader, a certain type of reader, or all the readers for whom he wants or needs to write. And finally, it may denote the extent to which various groups of readers or writers are able to exchange information using various types of materials. The present definition refers to the extent to which all people in the society are able to exchange information through whatever materials they want or need to use.

Extent-State of Literacy

Literacy may refer either to a variable that ranges from none to much or to a particularly desired level of that variable. We might say, for example, that one reader is more literate than another with respect to some particular material, meaning that he obtains more information from that material. This is one use of the extentive sense of the term. Then we might go on to use the term in its stative sense by saying that only one of these readers is literate on that material, meaning that only he could obtain the desired amount of information. Further, when we speak of a person being a literate reader, for example, we generally intend to indicate that he can achieve the state of literacy on all of the materials that he might realistically want or need to read. And speaking of a group or a society being literate generally indicates that all of its members have reached the state of literacy on all of their respective materials. Similarly, saying that a writer is literate generally means that he can elicit the state of literacy in his intended readers on each of the materials he wants or needs to write. And saying that a group or a society has achieved writing literacy generally indicates that its individual members have all reached this state of writing literacy. The sense of literacy chosen for use in this policy analysis employs the term in its extentive sense.

Volumetric vs. Incremental Extent of Literacy

Ordinarily the context in which we use the term literacy makes clear the sense in which the term is intended, except in some uses of the extentive sense. In such cases, it may refer to either of two different measurement operations. On the other hand, it may refer to a measure that increases in lumps, one material at a time. Measuring a person's literacy in this sense would involve testing his comprehension of a material, counting him literate if he answered a criterion number of questions, and then counting this material and each of the other materials on which he achieved this state as one, no matter how far he exceeded this criterion. Similarly, a society's literacy would be measured by counting each person simply as literate or not literate regardless of whether he slightly or greatly exceeded the criterion number of materials barely needed to classify him as literate. Thus, in this view, the extent of literacy goes up incrementally in large lumps, one material or person at a time. On the other hand, extentive usages may imply only that we count the total number of questions a reader answers on a material and then sum these scores across materials and then readers. In this sense, the extent of a person's literacy goes up smoothly in small increments and resembles a measure of the volume of information a person or a society might obtain. In actual practice, these two measures would undoubtedly be fairly strictly proportional to each other. However, for present purposes, it is far simpler to use the volumetric sense of the term.

Model of the Literacy Program

Three things need to be said in introducing this model of the literacy program. First, its immediate purpose is to identify the major determinants of society's literacy and to describe how those determinants relate to each other in order to produce literacy and the costs of literacy. This basic model will permit us to evaluate certain broad issues of literacy by casting them into the form customarily employed in economic theory and by invoking familiar and well-established principles of economics as we proceed with our analysis. Second, this model can then be further analyzed and elaborated in as much detail as might be needed in order to study literacy policies having any degree of breadth, ranging from the decisions confronting a classroom teacher, a student, or a writer up through the broad national issues that we will actually address here. However, we will only briefly indicate how these elaborations are performed and concentrate instead on the broad issue of why a balance must be struck between reading and writing instruction. Finally, it is presently possible to present the model only in a broad conceptual form. Although it rests entirely on familiar and firmly established scientific principles, we do not yet have available much of the data necessary to estimate all of its parameters. Nevertheless, even when it is cast in this generalized form, it will permit us to discover some useful things to know about the policies that govern the literacy program.

Form of the Model

Given that people have any desire to exchange information through the written word, then the volume of literacy (I) that is produced by its literacy program depends entirely on the level of people's reading ability (A), on the degree of comprehensibility or clarity (C) with which their materials are written, on the number of materials (M) that these people read, and on the number of people (P) who do any amount of reading. Which is to say,

$$I = f\,(A, C, M, P). \qquad (1)$$

Then the costs (K) of producing that volume of literacy are determined by the same four variables. Hence,

$$K = g\,(A, C, M, P). \qquad (2)$$

Taken together, Equations 1 and 2 assert in very generalized form the central facts of the literacy program and constitute the conceptual basis for further developing the model.

Before we do so, however, we should note two things about the model. First, it accounts for people's writing ability, albeit obliquely. The degree of comprehensibility of a material (C) is determined in part by the level of people's writing skills and in part by the costs of having them apply those skills to that material, chiefly the cost of the time required to prepare the material so that it has its level of comprehensibility and the cost of manufacturing a material having the length necessary to reach that level of comprehensibility. Writing and manufacturing costs and level of writing skill required seem to rise in steep exponential fashion as we try to reach very high levels of comprehensibility with a material. Second, the chief scientific issues raised by this model are how we might measure the volume of information a person obtains from a material, the ability of a reader, and the comprehensibility of a material, and then whether, other things being equal, the latter two variables fully determine the former. The information a person obtains from a material is fairly reliably indicated by this score on a question test or cloze test made from a material; then the comprehensibility of the material can be measured either directly using people's mean score on this type of test or indirectly using word length, sentence length, and other indicators of the complexity of the language in the material. People's reading ability can, under most circumstances, be measured satisfactorily using a commercial standardized test of reading achievement. As for the extent to which the information people obtain from materials is determined by their reading ability and the complexity of the materials, modern readability studies (Bormuth, 1966, 1969; Coleman, 1971) have consistently found that these two types of variables account for virtually all the reliable variance in measures of the extent to which people comprehend materials.

Further Specification of the Model

We can exploit the basic reasoning and scientific facts underlying this model to give it a more definite mathematical form. However, in doing so we will ignore intercept and slope constants, interactions, and nonlinearities partly for the sake of clarity, partly because one or two of them have not yet been determined, and partly because they are not essential for the immediate uses we will be making of the model.

Start with the proposition that the amount of information that a particular person (p) is able to obtain from a particular material (m) that he reads is increased with that person's reading ability and with the comprehensibility of that material. Which is to say,

$$I_{p,m} = A_p + C_m . \tag{3}$$

Then the volume or total amount of information that he can obtain from all the materials (M) that he reads in a given space of time is simply the sum of the amounts of information that he obtained from each particular material in that set. Hence,

$$I_p = \sum^{M} (A_p + C_m) . \tag{4}$$

And the total volume of society's literacy must be the sum of the amounts of information that each of the people who read anything (P) obtain from the materials they respectively read:

$$I = \sum\sum^{PM} (A_p + C_m) . \tag{5}$$

Since summation notations are a bit messy to work with, we will eliminate them by first deriving the expression for the mean volume of society's literacy ($\bar{I}$) by starting from Equation 5.

$$\bar{I} = \frac{I}{P \times M} = \frac{\sum\sum^{PM}(A_p + C_m)}{P \times M}$$

$$= \frac{\sum\sum^{PM} A_p}{P \times M} + \frac{\sum\sum^{PM} C_m}{P \times M}$$

$$= \frac{(\sum^{P} A_p)\, \cancel{M}}{P \times \cancel{M}} + \frac{(\sum^{M} C_m)\, \cancel{P}}{\cancel{P} \times M}$$

$$= \frac{\sum^{P} A_p}{P} + \frac{\sum^{M} C_m}{M} .$$

Since these last two terms simply represent, respectively, the mean reading ability of people and the mean comprehensibility of the materials they read, we can say that

$$\bar{I} = \bar{A} + \bar{C} , \qquad (6)$$

or, in other words, that the volume of the average person's literacy is determined by the mean level of people's reading ability and the mean level of comprehensibility of their materials. Then it follows that the total volume of society's literacy must be

$$\begin{aligned} I &= PM\bar{I} \\ &= PM\ (\bar{A} + \bar{C}) . \qquad (7) \end{aligned}$$

Thus, if we want to look just at the effects of increasing either the mean level of people's reading ability or the mean level of comprehensibility of their materials, we can do so by holding at their current levels the number of people who read something (π) and the number of materials they read (μ) to obtain

$$I_{\pi\mu} = \bar{A} + \bar{C} . \qquad (8)$$

Finally, by following the same line of reasoning, we could also find that the cost of producing a given level of literacy is given by

$$K_{\pi\mu} = \bar{A} + \bar{C} . \qquad (9)$$

It should be kept in mind, however, that Equations 8 and 9 would probably contain very different parameters if they were actually instrumented. In subsequent discussions of literacy policy we will rely primarily on Equations 8 and 9 as the expression of the model.

Elaboration of the Model

The basic model given in Equations 1 and 2 can be elaborated to fit the problems encountered by various decision makers. A congressional committee, for example, might regard Equations 1 and 2 as sufficiently detailed to comprehend many of the problems it deals with. But a school administrator might want to analyze the determinants of reading ability in more specific terms. Thus, he might begin by analyzing people's reading ability (A) as being determined by their motivation to read (MR), their aptitude for learning reading skills (AL), and the quality of their instruction (QI). Which is to say,

$$A = h(MR, AL, QI)\ . \tag{10}$$

Then he might need to further analyze the quality of instruction (QI) as being determined by the extent of teachers' training (ETT), number of audiovisual aids (AVA), the time a teacher can devote to each student (TTS), and so on (ETC). Thus, he obtains

$$QI = i(ETT, AVA, TTS, ETC)\ . \tag{11}$$

Then by substituting Equation 11 for (QI) in Equation 10 and Equation 10 into Equation 1, he might obtain

$$I = j[MR, AL\ (ETT, AVA, TTS, ETC)\ C, M, P], \tag{12}$$

which would presumably account for every variable that bore on the decision he was trying to reach, either by representing a variable that he could influence by his own policy decisions (e.g., influencing (ETT) by providing inservice training for teachers) or by representing a variable that sets limits on the effectiveness of his decisions (e.g., the students' aptitudes for learning reading skills).

Similar analyses may be made of the remaining terms in this equation. Comprehensibility of a material, at the second order of analysis, is determined by the skills of its writer, the time expended by the writers and editors of the material, and the length of that material--that is to say, virtually anything that can be written and phrased in a very simple and comprehensible form, provided that we are willing to pay the costs involved in training and employing highly skilled writers for as much time as they need to do their work and in allowing them to extend the materials to whatever length may be needed. The number of readers is determined by the size of the population, the need people feel for printed information, and the costs of obtaining that information--the latter being determined in turn by the costs of obtaining and using a material and the costs of achieving enough reading skill to comprehend a material of that level of complexity. The number of materials available to a reader is determined by the size of the reading public, the prices people are willing to pay for materials, and the costs involved in producing materials--the latter being determined by the expenses involved in printing and distributing materials and those involved in producing materials sufficiently simple for people having the level of reading skills of the intended readers.

Prescriptive Logic of the Model

We can use Equations 8 and 9 to prescribe how we ought to distribute our resources between efforts to influence people's reading ability and efforts to influence the clarity of materials.[4]

First, notice that these equations both contain two unknowns to the right of the equal signs. Mathematically, that means that we can reach any single level of literacy using various combinations of the variables to the right of the equal signs. Line I_1 in Figure 1, for example, represents the single level of literacy that could be reached by obtaining various levels of reading ability in people and comprehensibility in materials. Thus, we could reach point M on I_1 by spending the large amount of money needed to raise people's reading ability to point a and then by also spending so little for writing instruction and the preparation of materials that their comprehensibility would sink to point c. Or we could reach point N on I_1 by spending just enough effort to allow people's reading ability to reach point b while investing in the efforts necessary to raise the comprehensibility of materials to point d. In any case, Equation 8 clearly asserts that our present policies for funding these two kinds of efforts has put us at some point on an isoliteracy line such as I_1 or I_2.

Next, consider the fact that we could increase literacy from level I_1 to level I_2 in several ways. If we were now at point N on I_1, and if we did our usual thing of believing that reading ability was the only important determinant of literacy, we would hold constant (i.e., neglect) our efforts to increase the comprehensibility of materials and increase our efforts to increase people's reading ability. This would put us at point O and I_2. But we could just as well increase literacy in the opposite way, by holding reading ability constant while increasing the comprehensibility of materials and thereby hoisting ourselves to point Q, where we would be just as literate as we would be at point O. Or we might choose a somewhat shorter and probably less expensive path by increasing both efforts simultaneously in a balanced fashion and thus arrive at point _P_ where we would be just as literate as we would be at either point _O_ or point _Q_.

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[4] Those familiar with microeconomics will recognize the arguments that follow as a standard description of the theory of economic equilibrium (see Stiegler, 1966, for example), and those familiar with decision theory will recognize it as linear programming or operations analysis (see Baumol, 1965, for example).

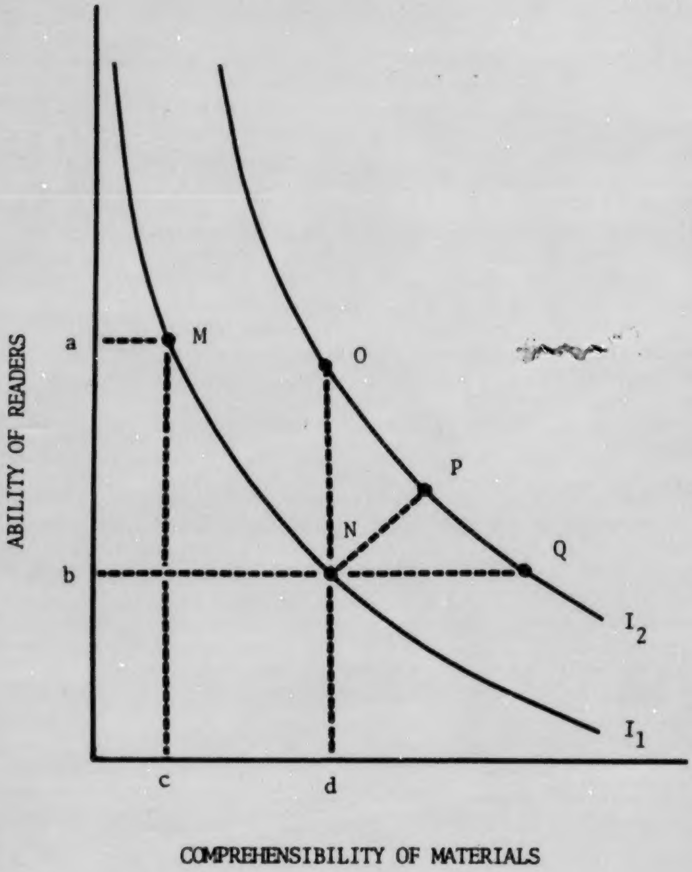

Figure 1. Combinations of levels of reading ability of people and comprehensibility of published materials that produce either level of literacy $\underline{I}_1$ or level of literacy $\underline{I}_2$.

Now the question is: would some apportionment of any given budget for literacy yield a higher level of literacy than any other division that we could make of that amount of money? The answer is almost certainly yes, and that apportionment would almost certainly require a balanced apportionment of that budget—some to efforts directed at reading ability, some to efforts directed at clarifying materials, and both amounts of effort carefully balanced to give us the most literacy that we could buy for our money.

Figure 2 shows several of the isoliteracy lines that we might obtain (if we knew the parameters of Equation 8), namely, lines I_1, I_2, I_3, and I_4. In addition, it shows an isobudget line such as we might obtain from Equation 9 if we also knew its parameters and if we set the total cost of our literacy efforts ($K_{\pi u}$) equal to the total amount of money that we had budgeted for literacy and then calculated the various combinations of amounts of reading ability and comprehensibility that we could buy with that amount of money. These combinations would all fall along a single line illustrated by the line extending from *A* to *C*. That line shows that we could, if we wanted, spend all of our budget for activities designed to impart reading ability while leaving nothing to spend on efforts to make materials more comprehensible. Doing so would put us at point *A* which would, as might be expected, eventually lead to a very low level of literacy, one that falls well below level I_1. Or we might spend the whole budget just for increasing comprehensibility and find ourselves at point *C*, which also represents a very low level of literacy. Or, we might balance our allocations to buy any of the combinations of amounts of reading ability and comprehensibility that lie along the line from *A* to *C*.

Obviously, we would want to buy the amount of each that would allow us to reach the highest level of literacy we could get for our money, and that would mean putting ourselves at point *P*, where the budget line touches the I_2 level of literacy. Thus, we ought to buy *a* amount of effort to teach reading ability and *c* amount of effort to clarify materials. And doing anything other than that would only leave us just as poor, but less literate than we could have been. If we did our usual thing of neglecting the clarity of materials, we might spend more for teaching reading and wind up at point *O*, where we would reach only the I_1 level of literacy. Or, if we repented these neglectful ways and overreacted, we might cut back reading instruction so that we could greatly extend writing instruction. And that could put us right back on level I_1, this time at point *Q*. The prescription for policy, then, is clear. We ought to balance our allocations carefully between efforts to teach reading and efforts to ensure the clarity of materials. Now, we need to find out what economic forces come to bear on literacy that make this the only sensible prescription for literacy policymakers to follow.

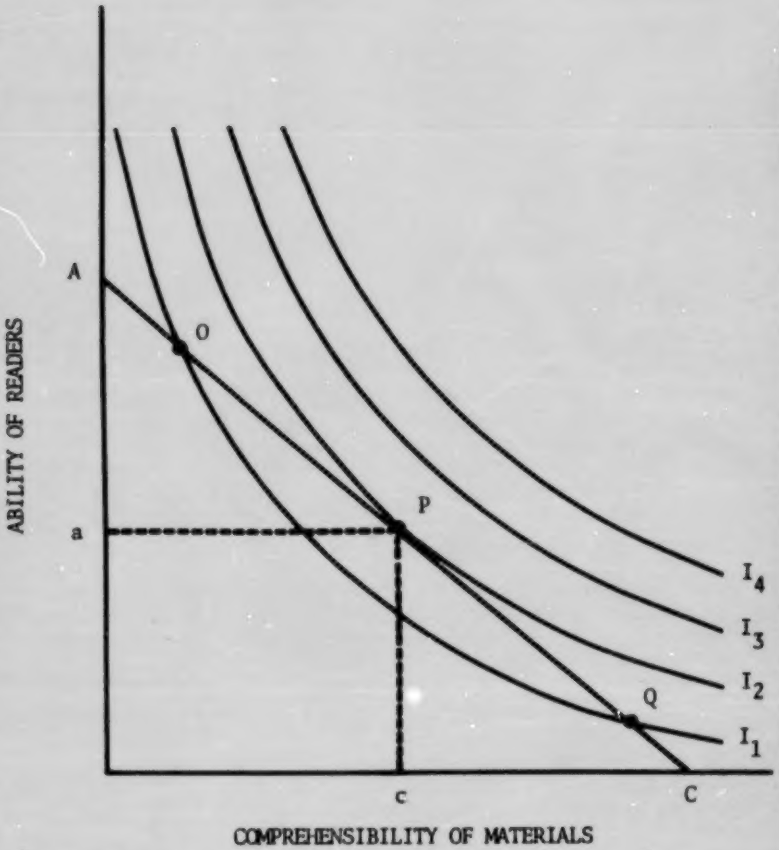

Figure 2. The allocation of resources that would produce the highest level of literacy in return for the resources spent.

Vulnerability to Inefficient Allocations

The literacy program is especially vulnerable to the wastes that must result from the inefficient allocation of resources to efforts to produce reading ability and clearly written materials. The problem arises in part from the fact that we have not had a precisely formulated model of the literacy program, in part from the fact that a major portion of the literacy program is conducted by schools which are socialized institutions that are insulated from the disciplining forces of the marketplace, and in part from the fact that the major adverse consequences of inefficient allocation decisions show up in ways that are fairly subtle and remote from the people who have to decide how to allocate these funds.

To begin with, there would be little reason to question the efficiency of allocations for reading and writing instruction if those services were like ordinary goods and services that are bought and sold in a free and competitive marketplace. Economic theory and an awesome amount of economic research (Stiegler, 1966) assure us that when people are left to themselves in the free and competitive market, they will tend to maximize the efficiency with which they spend their resources. Which is to say, they would tend to divide their resources between buying reading ability and clearly written materials in proportions that would hover close to point P in Figure 2, where they would be buying about as much literacy as they could buy for the resources that they felt they could spend on the matter. Any departure from that point would be certain to set in motion a train of counteracting events that would turn their buying behavior back toward this point of maximum efficiency.

But reading and writing instruction are not traded in a free and competitive market, primarily because reading and writing skills are much more valuable to society as a whole than to many of the individuals to whom these skills are taught. As a result, society has to bear much of the cost of this instruction and has done so through government-operated schools. And the officials of those schools are then forced to decide how to balance their appropriations between reading and writing instruction in isolation from the disciplining forces of the marketplace. That is, the funds and other resources allocated do not belong to these officials; these officials will not themselves directly benefit from their decisions; and the students who will benefit are in no position at their tender age to even perceive, much less appreciate, the costs and benefits of their instruction.

Nevertheless, school officials could and would avoid unbalanced allocations if they knew when, where, and in what form the consequences would appear. Unfortunately, their view has been blocked by three obstacles. Possibly the least of these is the fact that we have yet to develop an appropriate measure of people's literacy. A more difficult one is the lag of almost a generation between the time these allocation decisions are made and the time when the beneficiaries, or the victims, of these decisions enter adult society; and the relative levels of their reading and writing skills can have a significant impact on the other components of the literacy program, particularly on the publishing industry. Finally, if these decisions resulted in an imbalance of reading and writing skills, the impact these young adults would have would be deceptive. Initially, it would appear that society's literacy was rising. But the unbalanced supply of reading and writing skills in society would have already set in motion a train of counteracting forces that would eventually cancel much of the rise initially observed.

Figure 3 illustrates the kinds of consequences that would ensue from increasing allocations for reading instruction without counterbalancing efforts to improve the comprehensibility of materials. Suppose that people's personal budget for literacy results in the isobudget line _A_ to _C_ and that they generally allocate their personal expenditures of effort and money to obtain, on average, _a_ amount of reading ability and _c_ amount of comprehensibility of materials. Then suppose that educational policymakers increased public expenditures for literacy, putting all the increase into improved reading instruction. This probably would not have much effect on the total amount people spent personally on literacy, since they would not personally have to pay the bill in a direct fashion.

Rather, it would appear to them that reading ability had suddenly become cheaper. Thus, their budget line would tilt to run from _A'_ to _C_. The effects would be as shown. The volume of literacy would rise from $\underline{I_2}$ to $\underline{I_3}$ as their reading ability rose from _a_ to _a'_. But people would then compensate by personally spending less to obtain comprehensible materials and the average comprehensibility of materials being published would drop from _c_ to _c'_, cancelling much of the anticipated increase in literacy that would have been obtained had the policymakers properly balanced their allocations between reading instruction and efforts to increase the comprehensibility of materials. The same type of waste would have occurred, also, had the policymakers made the reverse error of putting all the increase into efforts to improve the comprehensibility of materials, only this time people would have neglected their reading abilities as the comprehensibility of materials rose. Let us then examine the economic mechanisms that produce these rather distinctly unpleasant results.

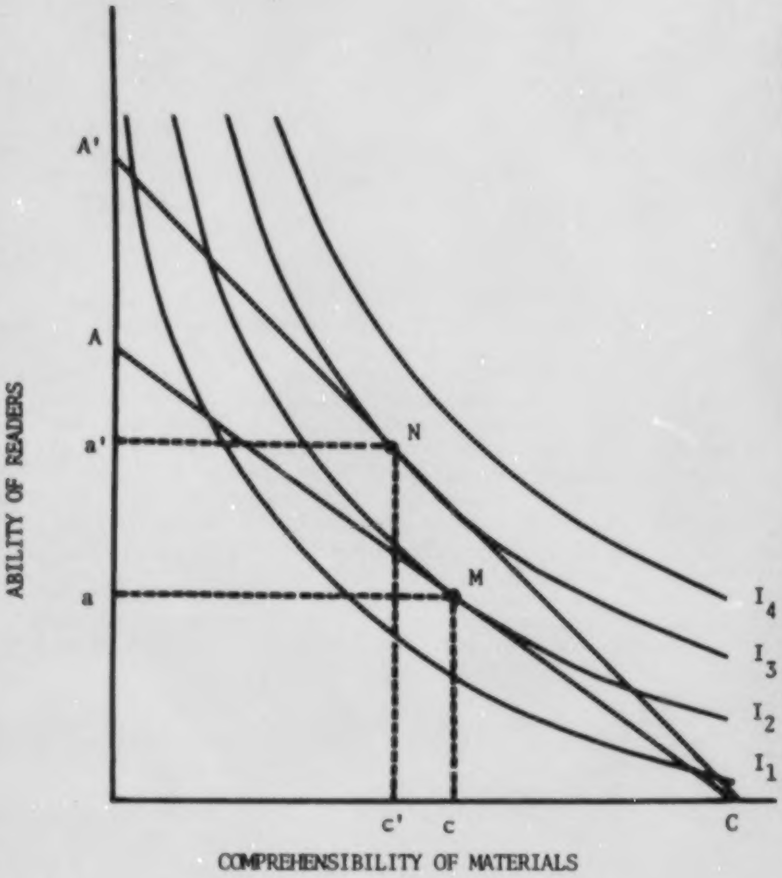

Figure 3. The decrease in the comprehensibility of published materials that would cancel some of the anticipated rise in literacy if allocations for reading instruction were increased without also increasing allocations for writing instruction.

Overspending for Reading Ability

Spending more money and other resources for reading instruction could generally be expected to increase students' reading abilities, and that, in turn, would eventually increase the average reading ability in society. Equation 7 then shows that this rise would increase the sum of the average ability of people and the average comprehensibility of materials, and that sum would then be multiplied by the total number of materials read and by the total number of people. Moreover, the rise in average reading ability would no doubt increase the number of readers and the amount of materials that were being read, increasing literacy still more. Hence, the immediate and patently obvious effect of increasing expenditures for reading ability would be a large increase in the volume of literacy. Unfortunately, much of this increase is likely to be only temporary.

To understand why, consider the fact that publishing is a highly competitive industry in which the prices of published materials are essentially beyond the publisher's power to control, being determined by the market. The only way a publisher can make enough profit to stay in business is by holding the costs of producing a material somewhat below the price it will fetch and then selling as many copies as possible. An important way to reduce costs is to cut the length of the material and thereby trim writing, editing, printing, and shipping costs.[5] The publisher cannot, of course, cut much information from the material since that is what people are really buying. But he can and (as every writer knows) does require his authors and editors to say what they have to say as briefly as is reasonably possible in order to save manufacturing costs and to ensure that he makes at least some profit.

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[5] The notion that publishers routinely manipulate brevity and comprehensibility of materials is a commonly known but rarely discussed phenomenon. It is a familiar fact that newspapers competing in the same city are able to carve out and hold their place in their market by identifying readers having a certain range of educational levels, catering to their tastes for news, and carefully trimming their writing to suit people having reading abilities in this range. Next, Flesch (1948) shows that limited-circulation magazines on intellectual content are written in relatively complex language while popular magazines are written in fairly simple language, and pulp magazines are written in the simplest language that he observed. Third, the average length of the sentence declined by about 50 percent between Chaucer's time and the present century (Sherman, 1888), a period during which the costs of printing, paper, and ink were dropping dramatically, making it possible for publishers

However, deciding how much brevity is reasonably possible is a bit complicated, for the ordinary writer and editor will have to achieve it by sacrificing a certain amount of comprehensibility by resorting to abstract and technical words compacted into complex sentences set in a context stripped of topic sentences and other aids to comprehension. The ensuing loss of comprehensibility can then make this material incomprehensible and unsalable to some who would otherwise have bought it. So, by overemphasizing brevity, the publisher could cut his profits more by losing sales than he would gain by enforcing brevity. A rational publisher will then try to maximize his profits by setting his brevity standards at the point where savings on manufacturing costs exactly equal his losses suffered from decreased sales of copies.

Now the effect of increasing only people's reading ability would be to throw the publisher's brevity practices out of balance. He will immediately, of course, start selling copies of his materials to a larger fraction of the population and both his profits and society's literacy will rise. But at the same time, the loss of sales that his brevity standard had been causing him to suffer will decline. This will make it profitable for him once again to reduce his manufacturing costs by further tightening his brevity standards. And he will be forced to do so whether he wants to or not. If he resists, competing publishers will tighten their standards anyway, reduce the costs of manufacturing their materials, lower the prices of their materials that compete with his, and force him either to tighten his brevity standards also or go out of business. In general it will be true that the greater the increase in people's reading ability, the greater will be the increase in the complexity of materials and the waste of

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to greatly increase their profits by lowering prices of materials and selling more copies, provided that they also increased the comprehensibility of the language with which those materials were written. Finally, it will come as no surprise to most that the scholarly journals, whose subscribers are among the best readers in society, are written in the most complex language.

resources. Moreover, none of the publishers who help to put this vicious spiral in motion can be morally impugned for the results, for it can be shown that those results actually make the best of a bad situation and actually maximize society's overall welfare as well as could be done in the face of an inherently wasteful literacy policy.

A very foolish, but unfortunately familiar way to try to forestall a spiral effect of this kind would be to demonize publishers, charge that their greed for profit had forced up comprehensibility, and thereby gain popular support for imposing government restrictions on the comprehensibility of the materials published. Since we have most of the technical tools required to enforce such regulations, we might be tempted to try. But we would not like the results. To begin with, most ordinary writers using present writing techniques can produce highly comprehensible manuscript only at great expense in money and time for field testing and trial revisions of manuscript. And we have only a tiny number of the kind of highly gifted writers who can consistently and efficiently produce comprehensible manuscript without resorting to these expensive measures. Therefore, the major immediate effects might include some increase in the comprehensibility of publications, but it would also include increases in the costs of materials, costs that would drive the purchase of many materials beyond the reach of many people, force many publishers out of business, reduce the quantity of materials being read, and thereby reduce the volume of society's literacy. Then in the longer run, people would notice that they had fewer materials to read and that those materials required fewer reading skills than the schools were teaching. Those with a long memory know the rest of this story, for when colleges and professional schools no longer required Latin for admission, public support for Latin instruction melted away until little or none is now taught in either high school or college. While reading instruction would not disappear, the amount of it would almost certainly diminish, average reading ability would plunge downward, society's literacy would take another large drop, and we would wind up a lot poorer and a lot less literate than we could have been had we pursued a more sensible literacy policy.

Overspending for Writing Instruction

If we went overboard in the opposite direction and stressed writing instruction while neglecting reading instruction, the initial effect would again appear to be pleasing. As the supply of highly skilled writers increased, a publisher could enhance his profits by employing writers to work on even routine publications where they would meet his brevity standards more easily and economically than present writers and at the same time produce somewhat more comprehensible materials. One immediate effect, then, would be to lower the publisher's costs of manufacturing materials, and the competitive forces of the marketplace would quickly translate his reduced manufacturing costs into lower prices for his materials. Taken together, the lower prices and increased comprehensibility of the materials reaching print would produce a fairly immediate increase in the volume of society's literacy.

However, almost immediately a set of counteracting forces would be set in motion. To begin with, the publisher could be expected to notice very soon that the savings he enjoyed from enforcing his brevity standards were no longer as great because those standards were being met more efficiently. Hence he would profit by tightening them until the declining comprehensibility of his materials once again lost him enough sales to offset the advantages of any further tightening of those brevity standards. This would cancel some of the initial increase of literacy but would probably leave literacy quite a bit greater than before. The major reaction would begin when many adults discovered that materials were so comprehensible that they no longer needed much of the reading ability they had acquired in school. Thereupon, support for reading instruction would decline, the quantity and quality of that instruction would diminish, and average reading ability (and hence literacy) would commence a spiral downward in pursuit of the declining complexity of materials. If we did not react by again overemphasizing writing skills, we would probably wind up with a bit more literacy than we had before, but not with nearly as much as we could have gotten in return for the resources we had spent on the latter.

Effects of Balanced Emphasis

These spiral effects could be avoided by taking some of the increased resources allocated for reading instruction and redirecting them instead to the kinds of efforts that would increase the comprehensibility of materials. These efforts could include anything that would lower the publisher's costs of doing business, including increasing subsidies for second- and fourth-class mail, initiating government support for research and development of more economical means of printing and papermaking, and even providing subsidies to cover publishers' janitorial costs. However, these measures would not be equally cost-effective. One of the most efficient means would no doubt be to reduce the publisher's costs of obtaining highly comprehensible manuscript. This could be accomplished by increasing the supply of highly skilled writers and the efficiency with which these writers produced comprehensible manuscript. Hence, this would entail increased research and development for more effective means of teaching written composition and an increased quantity and quality of composition instruction at all levels of education. The effect of these actions would then be to make strict brevity standards much less profitable to the publisher, allow him either to relax or at least hold the line on those standards, and thus to meet rising reading abilities with materials of stable or even declining complexity. In either case, more people would buy and use more materials and exchange more information through that use. In other words, we would get much more literacy in return for the price we had paid for it.

Conclusion

Literacy is an activity of great cultural, social, and economic importance that consists in the exchange of information from one person to another through the medium of written or printed materials. The industry that produces it can be divided into three components--one that teaches people reading and writing skills, one that produces the materials that people read and write, and one that distributes those materials to consumers. Literacy itself then occurs when information is transferred from writers to readers via the materials, and society generally wants to maximize the volume of information exchanged in return for the resources it allocates for this matter.

Most of the components of the literacy program are lodged primarily in the private sector of the economy, where we can generally count on ordinary economic forces to ensure that literacy is being produced efficiently. Instruction in literacy skills, however, is lodged primarily in schools, which are socialized institutions insulated from the conditions of supply and demand that discipline the private sector of the economy. And those schools are particularly liable to distort the economics of literacy by virtue of their insulation and the fact that most people have an unbalanced view of the relative importance of reading and writing skills. Whenever they think of literacy, they tend to think first, and often exclusively, of reading skills. And when they want to improve society's literacy, they are generally willing to allocate the added resources primarily and even exclusively for improving reading instruction.

Knowledge of our own biases in favor of reading instruction and a little economic theory strongly suggest that we are wasting substantial amounts of the resources we are spending for literacy. When schools decide on a course of action, they are likely to increase the supply of reading skills relative to writing skills without due regard for which type of skill would, if increased, result in the greatest increase in literacy for the resources being spent. People will consume greater amounts of the skill taught just as if it had suddenly become cheaper, for most of the costs of that instruction will be hidden by distributing them thinly over the rest of the economy in the form of taxes. But the private sector of the economy is forced to respond not only to anticipated benefits but also to its actual costs. The result is that the private sector would be forced to react to an unbalanced increase in reading ability, increase the complexity of materials, and cancel much of the anticipated rise in literacy. Conversely it would react to an unbalanced increase in the supply of highly skilled writers with a slight decrease in the complexity of materials and with a fairly large decrease in society's average reading ability. Again, literacy would not rise by the anticipated amount.

The only efficient course of action for the schools to take is to pursue a balanced program of support for both reading and writing instruction, a balance arrived at by considering both the costs and the benefits of reading and writing when they are viewed in full context with the rest of the literacy program.

Unfortunately, we presently lack some key pieces of data necessary to determine just how instruction in these two skills should be balanced. We do know, however, that we tend to neglect writing instruction and that we can greatly increase the supply of highly skilled writers by training just a few thousand people but that we can increase the supply of skilled readers only by training millions of people. So we can strongly suspect that we could presently get a lot more literacy for our efforts by spending more on writing instruction. We will not be able to solve this problem definitely until we have done a considerable amount of research; however, if it is true that a problem is half solved when we realize that we have it, and nine-tenths solved when we phrase it in the proper manner, then perhaps we have now covered some of the distance toward the solution of this one.

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FANTASY AND REALISM IN LITERACY ASSESSMENT

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In most discussions on literacy and its assessment, two frameworks can be discerned from which literacy is approached. The first, in the least pejorative terms that I can find, is labeled the rhetorical approach. In this approach, literacy is treated as a holy grail, much like brotherhood and citizenship. It is an absolute after which we are expected to chase with unswerving militancy and with unlimited resources. This is the literacy of the popular journals and of such works as Why Johnny Can't Read. The debates over this form of literacy, in words of the prospectus for this conference, "are characterized by rhetoric rather than logic, by intuitions rather than evidence, by slogans rather than scholarship." What they lack is what Pogo calls "wise words of wisdom." The second approach is the practical approach to literacy and it is revealed when we peel back the rhetorical veneer and examine policy rather than proclamations. This approach is discovered by an examination of resource allocations, assessment procedures, court decisions, and by other actions taken by those who are forced to make decisions related to literacy, including its assessment and instruction. Most of the public's expectations, unfortunately, are derived from the rhetorical framework, which is nurtured and propagated as much by academics as it is by amateur educators.

Where the rhetorical and the practical views of literacy meet, we often find interesting conflict. One of the better-known examples is the Right to Read Program. This began in the 1960s with bands playing, klieg lights flashing, and the late Commissioner Allen announcing that a million cadres would be sent into the cornfields and the bayous to search out the illiterate and to teach them in the right ways of American literacy. By 1980 there would not be a scrap of illiteracy to be found, no matter where you searched. Wonderful rhetoric! But when faced with the reality of funding such a program, Congress said, in so many words, "No dice," and allocated far less than what even a modest program would require. We have a Right to Read Program, which struggled against overwhelming odds to improve literacy in the United States, but it certainly has not had the impact that was projected by Commissioner Allen. In probably the first and only example of succinct and candid statements made by a government official before a congressional subcommittee, Commissioner Marlin, who succeeded Allen as Commissioner of Education, stated several years ago that the Right to Read Program "contained a great deal of rhetoric in its first year and a half, but did not contain any money."

The second example, which is more germane to interests here, is the problem of declining test scores. There is a major concern in the United States over the decline in verbal test scores from the period of roughly the middle 1960s to the present, as evidenced by the results of such tests as the Scholastic Aptitude Tests and the Iowa Test of Basic Skills. Industrialists have led us to believe that progress is our most important product; therefore, test scores should be increasing, not decreasing; therefore a decrease, and especially one that has lasted over 10 years, is a reason for national breastbeating.

This conflict between the rhetorical and the practical views of literacy, which is created mainly by those who believe that literacy is an absolute goal to be achieved at all costs, clouds most of the fundamental issues related not only to the test score decline, but to all assessment of literacy. I would like to consider a number of alternative views of literacy and its assessment and will attempt to demonstrate, first, that from the standpoint of educational decision making, that is, from a policymaking standpoint, literacy is a relative quality, not an absolute quality and therefore must be defined in terms of both the literacy needs of a society and the resources which that society is willing to allocate for it. This view is similar in some respects to that which Professor Bormuth has just expressed. Second, I will try to show that the decline of test scores since about 1963 is, in fact, a true statistical decline in whatever abilities these tests assess, but that the educational significance of this particular decline cannot be determined from available information and is probably insignificant. Third, I will attempt to convince you that the major issue in literacy and in the assessment of literacy today is not in the decline of test scores but in the continuing inequality in literacy instruction and literacy accomplishments between the disadvantaged students in this country and the advantaged. The difference in test scores between these two groups on almost any literacy-related test is significantly larger than the maximum decline for language-related test scores over the past decade. Last, I want to give some evidence to show that in fact the reading scores of the disadvantaged, and in particular the inner urban poor in this country, can be improved without a revolution in literacy instruction and without unreasonable investments of resources. There are successful schools in the inner-urban areas and what makes them successful are factors that are under the control of the schools.

Let me attend to the first issue, that of the relative nature of literacy, by first reviewing how various groups define or assess literacy. The first definition is that which historians use to assess literacy levels in prior generations. Historians have been attempting for some time to compare literacy in, for example, colonial New England and industrial England in the late 1800s with literacy today. The most frequently used evidence for such studies is signatures on wills. Historians seem totally content to evaluate literacy according to whether someone signed his name on a will or simply marked an X. Those who signed their names are considered to be literate (that is, are assumed to be able to read and write) while those who signed with an X are considered illiterate. Some of the more sophisticated studies attempt to find converging evidence through signatures on pensioner roles and other documents. For example, Lockridge (1974) estimated through signatures on wills that 85 percent of the males in New England who were educated in the 1740s and died roughly in the 1790s were literate, while only 60 percent in Pennsylvania and Virginia were literate (see also Cremin, 1970, and Schofield, 1968).

A second group which traffics in literacy is the U.S. Bureau of the Census. This organization defines a literate person as one who has the ability to read and write a simple message in any language. The assessment technique that it has decided on, given its limited resources, is to question an individual on whether or not he or she can read. The first question a census taker asks is "Have you had 5 years of schooling or more?" If the answer to this question is yes, the census taker marks literate and terminates the assessment. If the answer is no, the census taker asks one further question: "Can you read or write in any language?" If the person responds yes, he or she is classed as literate; if the person responds no, then illiterate. As unreliable as this may seem, it is probably as good as any technique, given the Census Bureau's mission, which is to archive from decade to decade the demographic characteristics of the citizens of the country.

A third group which traffics in literacy is the United

Nations, and in particular, UNESCO. Literacy in the beginning of UNESCO's mission was looked at very much as part of what was defined as fundamental education, which is, according to a UNESCO (1953) report, "that kind of minimum and general education which aims to help children and adults who do not have the advantages of formal education to understand the problems of their immediate environment, the rights and duties of citizens and individuals, and to participate more effectively in the economic and social progress of their community"--in simpler words, all of the best components of the Ten Commandments and the Girl Scout oath. (On early UNESCO Programs, see Gray, 1956.) By 1970, after struggling in many countries to initiate and sustain fundamental literacy programs, UNESCO changed its view quite considerably. It said, very simply, that a literate is a person who can, with understanding, both read and write a short, simple statement on his everyday life. And that stands today as the approach that UNESCO takes in pursuing literacy programs.

A fourth group which struggles with questions of literacy is the United States Army (see Sticht and Zapf, 1975). During World War I, the army initiated a massive testing program for personality traits and for basic academic skills, which of course included literacy. At that time the army decided that anyone who had a fourth-grade reading ability or better would be considered literate; anyone else would be given an army literacy training course. This fourth-grade criterion remained through World War II, but with Project 100,000 in the 1960s the army moved up to a fifth-grade level, the navy to fifth-and-one-half-grade level, and the air force to a sixth-grade level. Today, the army, on the basis of its own research, is moving away from an absolute definition of literacy. In its place it is attempting to define the literacy demands of each military occupational specialty (MOS), and then to develop assessment and instruction procedures that embed literacy training within training for the specialty itself. The army seems to be admitting that it cannot raise reading and writing abilities to a fourth-, fifth-, or sixth-grade level in the amount of time and with the resources that it is willing to allocate to literacy training. Recruits in the future will receive literacy training in relation to the needs of their occupational specialties. If they want to move to a new specialty, then they will have to acquire the literacy skills required for that occupation.

In each of the cases just cited, a practical need was met by a practical view of literacy. Assessment techniques were developed to be commensurate with the definition and with the resources that were available. Unfortunately this is not how we deal with literacy in elementary and secondary education. This disparity is probably why we are fussing over declining test scores. There are, so far as I can determine, sufficient data available in print to show that the decline in test scores does not come from changes in the test populations or in the test contents or in the scaling techniques that have been employed (see, for example, Harnischfeger and Wiley, 1975). The facts are as follows. For the elementary grades, scores are available on tests related to reading for Grades 3 through 8 on the Iowa Test of Basic Skills, for Grades 2 through 8 on the Comprehensive Test of Basic Abilities, and for 9- and 13-year-olds for 1971 and 1975 on the National Assessment of Educational Progress (NAEP). At the secondary level, scores are available from the Scholastic Aptitude Test and the American College Testing Program for college-bound seniors; from the Preliminary Scholastic Aptitude Test for high school seniors; and from the Minnesota Scholastic Aptitude Test and the Iowa Test of Educational Development for senior high school students. In addition, test scores for 17-year-olds (in or out of school) are available from NAEP for the years 1971 and 1975. For the most part, these test scores show a gradual decline from the middle 1960s, the decline becoming steeper with increasing grade level. But for the most part, the declines begin around Grade 4, Grades 1 through 3 showing little or no decrease over time. The only test that does not register a decline is NAEP, which shows a very small but statistically significant increase from 1971 to 1975 in overall abilities for 9-year-olds. When partitioned into the three reading components defined by NAEP, this increase is significant only for study skills and not for either of the two comprehension skills tested. (Thirteen-year-olds in NAEP assessments declined significantly in study skills; 17-year-olds showed no change.) All of the other tests show a decline that can be attributed only to the actual abilities that are measured. For example, the Scholastic Aptitude Test reported a verbal component score in 1963 of 478, which fell to 434 by 1975--a decline of about 10 percent in 13 years. It should also be pointed out that for many of these tests, scores increased gradually through the 1950s and into the early 1960s.

If we agree that the test score decline reflects a decrease in the abilities measured by the tests in question, that is, of reading-related abilities, then what educationally significant value can we assign to this result? The answer is none--absolutely none. Consider, for example, the Iowa Test of Basic Skills. Eighth graders in the state of Iowa scored an average of 84.5 on the Reading Subtest in 1965; eighth graders in 1975 averaged 79.0. Of course, we should be concerned that this trend may continue to the bottom, but aside from this intuitive reaction, what educational significance can we attribute to a 5.5 decline in the reading subtest of this particular test, a decline of roughly 6.5 percent? Are Iowa students today less capable of dealing with their high school reading materials than Iowa students were in 1965? Has the curriculum in the Iowa high schools changed in any way? Has the earning potential of Iowa students changed relative to students from states which have not shown a decline? I suspect that the answer to all these questions is no. From an educational standpoint, this may be a totally insignificant decline--that is, in terms of the abilities of the students to handle the grade-level materials that they are expected to handle as they go beyond the eighth grade.

One plausible hypothesis is that reading scores improved through the late 1950s and into the mid-1960s due to heavy government expenditures on education, especially after the success of Sputnik. Scores may have also increased because schools which were overloaded in the post-World War II baby boom finally began to stabilize by the middle or late 1950s. As sufficient numbers of trained teachers became available and as schooling techniques improved, so did reading and related verbal abilities. What we are seeing now is a subtle, perhaps unconscious, change on the part of schools, starting in the 1960s, to spend less of their resources on basic skills and to pay more attention to the individual, to society, and more recently to the environment. This is resulting in a small and educationally insignificant decline in test scores in verbal and in mathematics abilities, but these abilities appear to remain sufficiently high for the needs of further schooling and of citizenship.

Educators and concerned citizens will no doubt continue to argue about the decline so long as we have no applied definition of literacy, so long as tests remain abstractions, and so long as we keep a rhetorical view of literacy.

For a utopian society some might argue that all persons should possess all abilities that can be taught. But I doubt that even for a utopian society this is a desirable goal. Certainly in modern American society it is not. To teach all children to read at an eighth-grade level or tenth-grade level, or whatever criterion we select, requires expenditures of limited resources which are becoming even more limited from year to year. To achieve comparable levels of achievement in physics, in mathematics, or in clarinet playing also requires allocations or resources and must be considered along with literacy in a sensible curriculum. Choices always have to be made; priorities always have to be set. Literacy is usually assigned the highest curricular priority in an elementary school. But whatever level of reading can be achieved in roughly an hour to an hour and a half per day in the lower grades of language arts with a teacher and an occasional aide and limited remedial reading help is about the limit of what the average school is able to allocate on reading and other literacy-related components of instruction. Judging by their performance record, schools do not consider it totally their own responsibility to ensure that all children achieve an adequate reading level. All schools in general attempt to do this and succeed with a high proportion of the population. But still 5 to 15 percent of high school graduates have less than a fifth-grade reading level. The courts, however, seem to agree that the schools do not have unlimited responsibility for ensuring that every child reaches a particular level of reading instruction. Too many uncontrollable factors contribute to learning to hold schools totally responsible for reading failure.

All societies have to define their own literacy needs and allocate the resources they feel are required for meeting these goals. Neolithic Jericho, which possessed the ability to make bricks and statues from clay, domesticate animals, and build irrigation systems, had absolutely no need for literacy, and consequently (we presume) allocated no resources toward reading instruction. Colonial America desired somewhat minimal literacy for all males and allocated a rather minimal amount of its meager resources to this end. Modern America, on the other hand, places a rather high premium on reading ability for everyone, as evidenced by the amount of schooling provided and the amount of resources that go into literacy instruction. However, the level of reading ability attained is a function of the effort expended, which means not just time on-task but the total resources exerted for this end. Therefore, the only definition of literacy that is meaningful for educational assessment is one which is based both on societal needs and on resource allocation. There is nothing mysterious about adjusting definitions to meet needs and to change them as needs and our ability to meet these needs change. This is similar to how one adjusts one's speech in a conversation according to what one perceives to be the needs and abilities of the listener.

The issue in literacy is not whether today's children read better than the children in 1963, or the Minutemen, or the medieval English, or the neolithic inhabitants of Jericho, but rather whether modern America's need for literacy is being met better today than colonial America's need was met in 1776 or in whatever other year anyone wishes to compare literacy to. Given the agrarian nature of colonial society, it would have been foolish for the British to invest enormous amounts of their resources on literacy. In the same sense, neolithic Jericho, had there been alphabets then, probably would have found it foolish to do the same thing. Literacy is not an end unto itself. We should not, therefore, request investments of public expenditures for this cause without sufficient examination of the need for this ability.

But no matter how literacy is defined, differences in literacy attainment will exist. In some cases, these differences are no more than what would be expected from the distribution of human abilities. In other cases, however, the differences are so dramatic that something more than individual differences is suspected. An example of this latter condition occurred in fall 1976, when the Chicago School Board released reading scores for its K-8 elementary schools. In 13 of these schools, eighth graders read, on the average, at a fourth-grade level. The day after these scores were released, one of the Chicago newspapers published vignettes of the highest and lowest schools (Banas, 1976). The top school was Peterson Elementary School, which is located in a stable neighborhood on the northwest side of Chicago. According to the article, 70 percent of the 1976 graduating class had spent all 9 years in that particular school. One teacher claimed to have had a class with an average IQ of over 140. Large numbers of parent volunteers worked with the school; many special programs and activities were offered, starting at 7:00 a.m. The average teacher has been there about 14 or 15 years.

In contrast, the school at the bottom end in reading achievement, Ryerson Elementary School, was in a depressed area that had changed into a black ghetto over the past 10 years. It was built in 1898 to house less than 1,000 students but in 1968 had nearly 2,500 students. Almost every square inch of the playground and school yard was taken up with temporary classrooms. The school was forced to adopt a three-shift day, thus reducing the school day from 5 to 3-1/2 hours. Yet even with these conditions, it had the lowest per pupil expenditure in the city of Chicago. There is little reason to go beyond these simple facts in attempting to understand why Peterson Elementary on the northwest side and Ryerson Elementary in the black ghetto were respectively the highest and lowest scoring schools in Chicago in reading. (In reading tests given at a point where the norm would have been 8.7, Ryerson's eighth graders averaged 4.4 while Peterson's eighth graders averaged 10.3).

The causes for the differences between Peterson and Ryerson are obvious, but these schools are both rather special cases. However, studies have been made, such as Weber (1971) and those of the New York State Education Department and the Educational Testing Service, which help us to understand why some ghetto schools succeed in teaching reading while most fail. In some of these studies the concept of an "outlier" school is developed. A multiple regression equation is used to predict achievement (usually reading and mathematics combined) based on economic level of parents, percentage enrollment of black and Puerto Rican students, and other variables that are not easily changed by the school. Then a comparison is made between predicted level and actual level of achievement. Schools that score significantly higher or lower than predicted are identified as outliers. These schools are then examined in detail through observation of instruction, interviews with principals, teachers, and specialists, and analysis of programs and procedures. What emerges from all of these studies is a fairly stable set of variables that separates the successful from the unsuccessful schools. These variables include such traits as well-defined leadership for the reading program, setting reading as the highest curricular priority, allocating sufficient resources for reading, cross-fertilization of ideas among teachers, a high degree of individualization, positive attitudes toward children, and extra personnel within the schools. Method of instruction is generally not a significant variable, nor is class size, nor number of years of teaching experience. Attitude seems to be important, as is having a plan for reading instruction that is well defined in terms of teacher and classroom expectations. In one study that set out simply to demonstrate that some inner-urban poor schools do succeed in teaching reading, the four that were finally identified as successful all took somewhere between 3 to 9 years to implement the programs they had at the time they were observed.

Given that children from inner-urban areas score significantly lower on almost any verbal test than children from advantaged areas, it seems reasonable to set improved literacy instruction in these areas as a higher priority than stemming an educationally insignificant test decline.

But to achieve equality in literacy instruction we need to improve the quality of schooling in poorer areas. A program that concentrates only on literacy instruction is sure to fail.

In conclusion, I see literacy as a concern of society and therefore as an entity that must be defined in societal terms, that is, by the applications of literacy within a society. The measurement of literacy then becomes, in a broad sense, a measurement of the degree to which a person can function in, and contribute to, the goals of that society. But these goals must be commensurate with the society's investment in literacy and in practice are defined by resource allocations themselves.

A society that wants all its youth to read and write at an eighth-grade level, but provides no schooling for children in remote areas, is confusing wishes with realistic goals. The United States Army, as I have mentioned, has moved away from a goal of general literacy to one based strictly on the literacy requirements of army tasks. Part of the reason for this change was the realization that the resources they were allocating were insufficient for the former goal.

Given a practical concept of literacy, we must monitor schooling results; and when we find that certain groups of the population are not achieving adequately or certain occupational needs are not being properly met, then we know that shifts must be made in resource allocations. However cherished our rhetorical notions of literacy are, the exigencies of educational planning require that we reconcile our literacy goals with both the literacy requirements of society and our willingness to pay for the particular goals that we set. All army inductees in 1978 will not be reading at the fifth-grade level at the end of their induction training, nor will illiteracy in America be eradicated by 1980 or 1990 or 2000. What we can and should hope for in the near future is that a practical concept of literacy be adopted for American education and that sufficient resources be allocated to eliminate the inequalities that exist in literacy levels between advantaged and disadvantaged children.

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RESPONSE TO JOHN BORMUTH

Rexford Brown
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There is a line in a letter from Flaubert to Turgenev which reads, "I am sorry this is such a long letter; if I had had more time, I would have written a shorter one." As a managing editor, I have learned, as Professor Bormuth contends, that it takes more time and money to write shorter and more comprehensible material. There is also a favorite New Yorker cartoon of mine which shows a disheveled man crossing the street in New York and stubbing his toe on the curb. As he recovers, he raises his fist and he shouts, "Damn you, Lindsay!" In order for me to make some of the points I want to make today, I will have to sound somewhat like that person. Both papers are so reasonable that I am forced to respond to them in some unreasonable, irrational, perverse, or even insane way, in order to strike a balance. What I want to say are some things that will reflect a deliberate exaggeration of the situation, because one of the things I learned while teaching literature is that very often you have to exaggerate something in order to see it. It's there, it's potent, it's at work, it's important. But sometimes you have to blow it all out of proportion in order to call people's attention to it. I will be doing a bit of that with respect to the reading movement and what I consider to be an overemphasis on reading over the last 10 to 15 years. I will also be doing it in support of Professor Bormuth's contention that resources must be balanced more evenly in language arts programs.

Literacy is an extremely complicated matter. Both speakers have said as much; I feel obligated to say as much myself. When we are instructing children, the shift from an oral orientation to print is not just a mechanical matter to the child, or to the person from an oral culture. The shift that we demand when we insist on literacy is a shift to a very different world view. When, for instance, we take papers away from children, most of them do not understand why. It is not at all clear to them that the pictures and the writing that they have put on the pictures are going to be taken far away from them, at such distance that they won't be able to explain to you what it is that they are trying to communicate. They are not at all sure that they approve of the adult desire to fix things, to write things down, to linearize, to take feelings and ideas, put them on a piece of paper as if locking them in a safe, somehow making them concrete. Of course, we give great power to children when we give them literacy. But we should not expect them automatically to accept such a strange world view, so difficult to acquire, so very complex, so demanding that it requires profound emotional shifts in their perspective on life. If education in literacy is not done with sensitivity to the enormity of the demand and to the emotions involved, it can be botched. It will then be counterproductive. Literacy policy, then, is not just a matter of either school or economic or political policies. It is not just instructional gimmicks and games and programs and profits. It is a highly personal and highly emotional matter, tied to arbitrary cultural demands which are not necessarily linked to human needs. It is value laden; it is very often arbitrarily tied to intelligence and deeply affects the self-image and self-respect of learners. Great care should be taken in formulating a literacy policy for this reason as well as for those that the previous speakers have so well given us.

I want to address the bulk of my response particularly to Professor Bormuth's paper. I support his conclusion wholeheartedly. But I arrived at that conclusion from an entirely different perspective. Rather than going back over his point of view, I want to add another way of looking at the matter in the hope that the more ways we have of arriving at the conclusion, the more powerful the conclusion might be in persuading people away from a policy that allocates too many resources to only one aspect of the language arts program in America.

There are two assumptions in Professor Bormuth's paper that are very well taken: the first is that reading has, in fact, received more attention and more resources than writing over the last decade and a half or two decades. That is supportable. It has certainly received a good deal more attention than writing has, whether we are talking about economic attention, public attention, or educational attention. The second point raised by Professor Bormuth is that literacy policy is not formulated in a rational manner. I think that is easy to support as well. I want to ask, today, why are those things so? My thoughts on this matter started a couple of years ago, when I was asked to interpret the results of a state-wide assessment of reading and writing skills. While talking to the state Right to

Read coordinator, I discovered that she was disturbed by my background. She said that although it was true I had taught English for 7 years and had a doctorate in literature, she wondered if I knew anything about reading. And I began to wonder, too. Maybe I don't know anything about reading, I told myself, and maybe I should not take this job. When I was on the airplane going back home, however, I reconsidered. If I don't know anything about reading, I thought, there is something wrong. To be sure, there are some esoteric matters, some research matters, and some pedagogical matters about reading of which I am ignorant; but I know a good deal about reading. So, I went on to do it. But that is when I began to ask myself, why is there a "right to read"? Why is there an International Reading Association? Why were there reading specialists and reading centers in my state but no Right to Write program? There was no International Writing Association, no writing labs and writing specialists, and no writing centers in my state.

Some of the answers to my questions are quite obvious. Reading had become politicized. Someone had said, in effect: "Learn to read, so when you are in the voting booth you know my name." There is another side to it too: "Look, I'd like you to vote for me, but please, no letters, I'm busy." So why learn to write? The politicization of reading was a natural thing, given the civil rights climate of the early 1960s. It had an empty slot waiting in the educational community--a slot that had once been filled by a couple of generations of teachers who were instrumental in naturalizing foreigners--in Helping Those People. Furthermore, there was a lot of guilt ready to be tapped, and there was money--federal money. Reading teachers, elementary teachers, and English teachers, like everyone else, have felt for some time a need for greater appreciation and higher status; it became apparent that the way to get those things was to change one's major and go into the area of reading.

There are some less obvious reasons, however, for the polarization toward reading. One is that when the political aspects of reading became prominent, there were, as a consequence of the great postwar testing boom, a number of reading tests. Thus, if you were a Washington bureaucrat about to spend federal dollars in some area of language arts and you wanted accountability for your money, you were likely to put money in an area where there was test feedback. And there was at that time very little professional argument about what constitutes quality reading, as there would be if you decided you wanted a writing program.

Reading appeared easier to teach than writing and lent itself far more readily to the production of textbooks and graduated programs of instruction.

Reading is complex; politics are not sophisticated. Politically motivated movements, even in education, however well-intentioned they are, have a way of concentrating on the practical, the pragmatic, and the dramatic. One of the things that worries me about intense public and political interest in reading, intense interest in literacy, or even--should it happen--intense interest in writing is that the interest is always in low-level achievement and not in achievement across the board, not in the acquisition of sophisticated skills, attitudes, and perspectives on experience.

Thus, in spite of the fondest hopes of many people in the reading movement, the focus was primarily on the most dramatic of the illiterate and in-need, and the emphasis was on bringing them up to very rudimentary reading levels. The pressure to produce results was great even though no fully accepted or adequate theory of language acquisition and development existed. There were few adequate psychological frames within which such a movement could work. There was a simplistic behavioristic notion of language and verbal behavior, only crude test instruments, and no notion of how the new reading programs would mesh with existing writing, literature, and language programs in which every child would have to spend 7 or 8 years. Although many gains were made in our knowledge during this period--and according to National Assessment data, some improvement was registered in functional literacy--inevitable, unintended effects may have offset the gains. To begin with, a strange marriage of instruction and tests developed; after a while, tables of contents in reading books were identical to the units of the reading tests themselves. Because reading was defined early on as that which could be tested with multiple-choice tests, it was taught that way--with no evidence that the content of the subject "reading" was limited to the domains staked out in the tests or that the activity of test-taking was a good kind of reading to subject students to. This leaves some queries. Did this marriage of reading and test programs lead to the atomization of the reading process, artificially breaking it into convenient but arbitrary units? Did children learn that there is one right meaning per paragraph? Or one right pronunciation of Rochester? Or one definition per word? Did they learn that meaning resided only in the test and not in themselves? Or that reading was a hunt for the right answer to questions that they themselves would never have asked? Did some learn through all of this testing that reading is an exercise in being wrong? Was there, in short, for a number of reasons, a trivialization of the subject and an oversimplified and understimulating pedagogy?

If you think, as I do, that this might have happened, then you might probably also think that instruction in writing would have counteracted some of those trends. Why did writing receive so little emphasis in the primary grades? Why was it not taught? It is harder to teach, of course, and it involves motor skills that children do not develop until later on. It is more expensive to teach, too. And there is not much professional agreement about what it is and how it can best be taught. Also, politicians want votes, not letters (I say this playfully, but with a certain amount of seriousness). Remember that there is a difference between reading and writing in this respect --to train students in writing is to train them in human agency, in acting. I was told that there was someone at the conference who was teaching at a military academy. He was teaching the cadets to read and the officers to write. Was there, during the sixties, a similar attitude about the relative social importance of reading and writing, an unconscious preference for citizens who can receive information over those who would send information?

If a variety of political, social, and economic factors combined with a burgeoning test industry to overemphasize reading and overconcentrate on low-level, easily testable aspects of reading, then we might predict some educational consequences. We might predict, for instance, a decline in higher-level reading skills; and, in fact, National Assessment data do show that between 1970 and 1975, there was a decline in inferential skills. It is true that when you mush together the various areas of Reading Assessment--study skills, inferential skills, and literal reading skills--you do not see much change at our three age levels. But if you look only at the results for inferential reading, you do see a decline in that capacity. Carried to an extreme, it might suggest that we are headed for a nation in which everyone can read stop signs but not much else. We might also expect to see a ripple effect in other language skills. Without any research evidence, but only hunches, let me ask: would a reading program that overstresses low-level skills explain the literalism that literature teachers complain about in their students? Would it explain why the most common way students respond to a work of poetry, an essay, or a story is to try to retell it? This literalistic approach is not so marked in other countries, as Alan Purves found in the International Assessment. In fact, there is a very marked difference between American and English honor students in English in this regard: many more English students seem to know that they have the right to evaluate a work of literature, to do much more with it than paraphrase it. Why do so few American students know that? Is it possible that an overemphasis on very pragmatic matters in early reading training is at work here? Is it possible that this also explains the appalling ignorance of American students about the roles and functions of language and the importance of language for the individual and for the culture at large? Does this emphasis on minimal skills and on the utilitarian aspects of language set people up for propaganda, for double-speak and manipulation? Does it warm them up for television?

Time does not permit the asking of more such questions. I would only like to stress, in closing, the point that if our approach to language, for various political and economic reasons, is utilitarian and literalistic, or overemphasizes the propositional, the informational aspects of language, then we cannot produce people literate in Professor Bormuth's sense. We can produce only people who send and receive on a very narrow band of the language spectrum --a nation of reading and writing CBers who know nothing about the AMs and FMs of language, let alone the radars that poets play with. This is one potential consequence, it seems to me, of a maldistribution of resources. If you add to it the kinds of professional friction that many of us are familiar with, the bickering, the turf defending, the redundancy of cost and effort between the International Reading Association, the NRC, the CCCC, the NCTE, and the vast numbers of departments of English and language arts, you get a feeling that this atomization, this overemphasis on some aspects of language use and not on others has been bad professionally and consequently bad for the students at large. So I would support Professor Bormuth's point of view heartily: we should not allocate our resources in an inequitable manner; they should be balanced. And I support it on the grounds I have just sketched, in addition to those that he has advanced.

RESPONSE TO JOHN BORMUTH AND RICHARD VENEZKY

Jack Merwin
University of Minnesota

This first session of the conference Minnesota Perspectives on Literacy seems most appropriately related to "Literacy: Definition and Assessment." The speakers have prepared papers that are quite divergent in their content and the proposals they offer. While this also seems most appropriate for an opening session, it does call for separate responses to the papers, rather than an integrated response.

A danger in having respondents on the program is that they will give their own versions of what the paper authors should have said rather than responding to what they did say--particularly if a respondent is also an expert on the topic. This cannot happen in my case, since I lay no claim whatsoever to being an expert on literacy. Rather, my reactions and comments come from my training and work as an educational psychologist and experiences as a teacher, researcher, and administrator.

Professor Bormuth has, to the benefit of this conference and possibly the improvement of literacy programs, presented a new way of looking at the matter of literacy development and instruction aimed at fostering that development. This is refreshing. He equates "volume of literacy" to the amount of information exchange between the writer and those who read what he has written. Based on a number of assumptions, some related to the economic marketplace, he builds his argument and asks us to accept his major conclusion that resources devoted to literacy instruction should be evenly divided between reading instruction and writing instruction.

For me to buy this conclusion, I felt there were a number of questions I needed to have answered, some of a conceptional nature and some of a more technical nature that are related to the model he presents. While some of these questions are indeed answered in the paper, in the brief space for this response I will simply mention a few, the answers to which I cannot find, starting with those related to the conceptional development.

1. What does the author mean when he uses the word literacy in this paper? He is obviously limiting it to the writing and reading modes of communication, as many do. Beyond this, he defines volume of literacy as the amount of information exchanged. These seemed the parts of the paper most closely related to the question. However, I feel I still do not know the answer to the question of what the author means by literacy.

2. Is literacy being referred to by the author as some combination of the reading and writing abilities of an individual or society as a whole? The formulas of the model seem to imply that the literacy of individuals--even say, an author and a 4-year-old--are additive. He seems to be saying that the goal of literacy instruction should be to maximize the "volume of literacy" in society. I was not sure, however, what the implications of this are for the instruction of individuals.

3. Is literacy for the individual best considered in terms of an amount or in either-or terms? Is there a place for the concept of illiteracy?

4. Who determines what a person "ought" to be able to read and write to demonstrate his "literacy"?

5. Will the ideal "literacy program" be focused on increasing reading and writing skills or on increasing the amount of information exchanged using a number of "materials"?

6. Since the model calls for knowledge of the "number of materials," what is "a material"? Is it a word, a sentence, a paragraph, a book?

7. Is the relationship between the comprehensibility of "a material" and the reading ability of the person reading it one of independence or interdependence?

8. Are the development of reading and writing skills independent, or might one be enhanced by instruction aimed at the other?

9. What is the relationship between the development of one's "literacy" and one's ability to exchange information in ways that do not involve reading and writing?

I would need clarification on these conceptual matters before I could say whether I can accept Professor Bormuth's conclusion regarding the use of resources for reading and writing instruction. If the answers to these questions are in the paper, then it is difficult for me to determine whether it is my illiteracy, or maybe low volume, extent, or level of literacy, or the lack of comprehensibility of the paper that keeps that information from making the exchange.

Professor Bormuth has admittedly only briefly sketched out his model in this paper. In its further development, one might well look for answers to the following questions.

1. How are units of "ability" and "comprehensibility" to be selected to meet the requirement of the model that they be additive to get units of "information" ($I = A + C$)?

2. How does one develop meaningful measures of comprehensibility and ability to read that have the orthogonal relationship seemingly required for the model?

3. How does one meaningfully equate the outcomes of a dollar spent on reading instruction and a dollar spent on writing instruction?

4. If a small number of people will produce a very large portion of the materials to be read, is it desirable to split the resources spent on every individual half and half on reading and writing?

There are many other questions that could be raised. However, Professor Bormuth has offered a significant challenge to the field of literacy in requesting a look at a different approach to the making of decisions involved in the use of resources for literacy programs.

Professor Venezky offers some interesting proposals in his paper and forces one to face up to the realities of decisions that must and will be made. I would like to comment on just five aspects of this paper: (a) definition of literacy, (b) problems of assessing literacy, (c) goals of "literacy" education, (d) a relationship between goals of literacy education and resource allocation, and (e) characteristics of "successful" reading--not literacy--programs.

Professor Venezky is clear and consistent in speaking of literacy as a characteristic of individuals. He provides three examples of different uses of the term literacy: as an either-or characteristic, as reflected in comparisons of the number and percentage of people in a population who are literate; as a quantity or amount, as expressed in people's concern over the lowering of test scores; and specific job-related literacy, as now being used by the army. This nicely points up the confusion created by lack of common definition and the problems of communication it causes.

Professor Venezky seemingly relates literacy to both reading and writing. However, in speaking of assessment, he addresses only the matter of assessing reading ability. This leads one to wonder if he believes that "reading" measures can serve as "literacy" measures. He very nicely points up the problems related to "job sample" assessment, but I would have liked to have heard him elaborate on this in terms of (a) the relationship of assessment to the different definitions of literacy that he identified, and (b) the relative value of a "job sample" measure of what a person can do at a given point in time and a more efficient indirect measure predictive of what he will be able to do in a broader set of situations in the future.

In his consideration of literacy education, Professor Venezky limits himself to functional skill development. This leads one to wonder about several aspects of his proposal. How inclusive is the "functional" criterion? Would it include academic reading skills needed for further learning? Where does "non-functional" literacy begin? Should resources be spent on its development, or is there a minimal level of development for everyone beyond which limited resources should not be expended?

Professor Venezky seems to relate resource allocation on a one-to-one basis with what will be accomplished. One might wonder, then, about the contributions of time devoted to instruction and student effort. Also, this position seems inconsistent with the fact that a number of the salient characteristics identified in schools with "successful" reading programs are attitudinal and probably could not be "bought" by other schools even if they had more resources.

Everyone, including Professor Venezky, seems to accept both reading and writing as part of literacy. One wonders, then, about the implication of characteristics of successful reading programs as being those of successful "literacy" programs. Is it possible that these schools neglect writing and do a poor job of teaching writing because of their emphasis on reading? Being unaware of what research has found on the relationship between the development of reading and writing skills, my hunch is that they do not do a poor job of teaching writing. The issue, however, seems to be directly related to the conclusion reached in

Professor Bormuth's paper.

I share these questions prompted by these two papers not because I think this is a simple matter or that there are simple answers, rather because I recognize the complexity of the problems of literacy development and the need to consider all aspects of these problems.

Again, I think the divergent ideas set forth in these papers are right for the times and that they offer meaningful challenges for those who work in the field of literacy development.

REPLY TO JACK MERWIN

John R. Bormuth

I should perhaps begin by apologizing to Professor Merwin. When he accepted the assignment of commenting on my paper, sight-unseen, he no doubt assumed that I would be wearing my educational psychologist's hat only to discover that I was actually going to look at literacy from the broader point of view of a social scientist who sees literacy as a social or ecological activity that must be understood not only as a psychological phenomenon but also as an economic activity. Let me take up his questions in the order in which he posed them and see if I can improve a bit on the comprehensibility of the paper.

First, however, let me hasten to deny his opening assertion that I said, or even implied, that the resources devoted to literacy instruction should be evenly divided between reading and writing instruction. To quote the opening remarks of the paper, I said that my purpose was to present a model that would allow us to formulate and evaluate literacy policies and "to demonstrate its use by showing that achieving and increasing literacy efficiently depends on our maintaining a proper balance among several activities" (emphasis added) with particular attention being given "to the balance between reading and writing instruction." Now the proper balance between reading and writing instruction no more implies an even, half-and-half division of resources between reading and writing instruction than a proper balance of the diet of a family implies evenly dividing the food to give exactly the same amount to the adults and infants. Quite the contrary, throughout the paper I try to emphasize at every possible point that the model is needed precisely because simplistic notions of evenly dividing literacy resources would probably be wasteful. And to emphasize that point, I point out in the last paragraph "that we can greatly increase the supply of highly skilled writers by training just a few thousand people but that we can increase the supply of skilled readers only by training millions of people." But the effects on the total volume of literacy are likely to be identical. I most earnestly do not advocate an even division of resources and would not have even thought of developing this model if I had thought that an even division of resources was desirable.

Professor Merwin then posed nine questions that represented some of the conceptual problems that he had while reading the paper. Let me repeat each and then answer it.

> 1. What does the author mean when he uses the word literacy in this paper? He is obviously limiting it to the writing and reading modes of communication, as many do. Beyond this, he defines volume of literacy as the amount of information exchanged. These seemed the parts of the paper most closely related to the question. However, I feel I still do not know the answer to the question of what the author means by literacy.

It would, of course, be impossible to measure the volume of spoken language; I therefore limit my usage of the term literacy to refer to the written word. More than that, however, I stipulate in the paper that I will let the term volume of literacy refer to "the total amount of information that people exchange through the materials they want or need to use" and subsequently give this description operational specificity by saying that we would index a person's reading literacy if we tested the comprehension of a material, "counted the total number of questions . . . answered correctly . . . and then summed these scores across materials." This might seem clear to most people, perhaps. But it could be confusing to those who have been schooled to think that literacy means identically the same thing as the reading and writing skills that the schools instill in students' heads and that are measured separately and distinctly using the commercial, standardized tests that bear the labels reading or writing achievement.

This is, however, a narrow way of thinking about literacy. People do not spend a major fraction of their lives undergoing reading and writing instruction and society does not spend huge amounts of money paying people to read and write while at work just for the pure hedonistic pleasure they get out of those activities. What society is buying with all of those resources is the exchange of information. That exchange is literacy itself and cannot be measured using tests of skills achieved.

When society sets out to achieve literacy, it of course needs to teach people to read and write, and it also needs to develop some other essential skills such as paper-making, publishing, and transporting materials. Would we say that the tonnage of newsprint produced annually is a measure of literacy itself? No single subset of those skills could be literacy itself or could, by itself, achieve literacy. In what meaningful sense could we say, for example, that a highly skilled reader enjoys literacy when in fact he lives on a desert island and has nothing to read? It takes all of these skills combined to produce literacy for us, and literacy is the end product of applying all of these skills. Literacy is the information that people exchange through the written word. So the only reasonably direct way to measure the extent of people's literacy is to test their performance on comprehension tests made from their materials. Tests of reading and writing achievement, then, are merely remote indicators of what society, as distinct from schools, is trying to achieve.

Then Professor Merwin is further puzzled by the fact that literacy can be directly measured not by the two very different achievement tests used in schools but by one and the same test taken by one and the same reader. That is, a reader's score on a comprehensibility test provides not only a measure of the extent to which he comprehended the information in that material (and therefore his literacy with respect to that material) but also the extent to which that material's author was able to convey information to that reader (and therefore the extent to which that author was literate with respect to this particular reader).

> 2. Is literacy being referred to by the author as some combination of reading and writing abilities of an individual or society as a whole? The formulas of the model seem to imply that the literacy of individuals--even say, an author and a 4-year-old--are additive. He seems to be saying that the goal of literacy instruction should be to maximize the "volume of literacy" in society. I was not sure, however, what the implications of this are for the instruction of individuals.

To repeat, reading and writing ability as they are measured by a commercial, standardized test of achievement of reading or writing skills must not be confused with reading and writing literacy, which must be measured using comprehensibility tests made from the materials a person might want or need to read. Of course it would make no sense to add a child's reading achievement test score to the composition achievement test score of an author, and the model at no point proposes or even implies that this be done.

The model does, however, assert that we can add the comprehensibility test scores of readers to determine the total volume of reading literacy each or all readers might achieve or to determine the total volume of literacy each or all authors might achieve. And it further implies that the total volume of literacy achieved by all authors in society exactly equals the total volume of literacy achieved by all readers in the society--which, in turn, exactly equals the total volume of literacy of the society as a whole, just as the definition of literacy required.

I do not believe that I said, or implied, that society should maximize the volume of literacy, for that would imply the absurd proposition that we could never acquire enough literacy. Clearly no one would seriously want to convey or obtain all the information published or would want to go to the trouble and expense of learning the reading and writing skills necessary to do so. One can get too much literacy, just as one can get too much of any other earthly thing. What I did say was that society wanted to maximize the volume of literacy it received in return for the resources spent on literacy--its literacy per dollar, as it were.

The exact implications of maximizing "literacy per dollar" (as I went to considerable length to explain in the section entitled Elaboration of the Model) would then be determined by expanding the basic model presented to take account of the major dimensions that can be varied in a student's instruction and conditioning these dimensions on the variables fixed by decisions reached at higher policy-making levels using more generalized forms of the model. If that section of the paper is studied closely, this may be seen to be nothing more esoteric than a standard operating procedure routinely used in most economic policy analyses and calling for only a rudimentary exercise of elementary algebra.

3. Is literacy for the individual best considered in terms of an amount or in either-or terms? Is there a place for the concept of illiteracy?

First, as I explained in the section entitled Extent-State of Literacy, it is useful to speak of and assess literacy both as the extent to which a person obtains or conveys the information in a material and as the happy state in which he has obtained from it all that he wants or needs. Second, there is a legitimate use for the concept of illiteracy, which is normally taken to mean an undesirable state in which a reader, for example, can obtain no useful amount or kind of information from a material. But we must be careful to distinguish that concept from subliteracy, the broad gray region that lies between the state of being able to obtain no useful information and the state of obtaining all that the reader might want or need. Also, to keep matters clear, we must distinguish illiteracy from a state that we might dub nonliteracy to indicate that this reader might not only be unable to obtain information from materials but also that he and his society believe, all things considered, that this is the most desirable state of affairs for him. Here I am thinking of extremely mentally handicapped people who would have to spend a large fraction of their lives even to acquire just enough reading skill to find the right rest room door or the person in a developing nation whose reading instruction would consume resources needed to sustain the lives of others and would have little or nothing to read once he acquired those skills.

4. Who determines what a person "ought" to be able to read and write to demonstrate his "literacy"?

Unfortunately, no one does at the moment--no one, that is, except some elementary school teachers who use an obscure procedure called the informal oral-reading inventory to determine if a material is suitable for use in a student's instruction. More broadly, however, our society's norms would probably require that this decision be reached jointly by the individual himself and by society. This presents no particular problems from the standpoint of literacy assessment research since we can project a person's wants by first getting a fairly clear notion of the lifestyle he leads, or aspires to lead, and since society rather forcibly makes its will known by presenting us, in a sink-or-swim fashion, with street signs, tax forms, and the like.

5. Will the ideal "literacy program" be focused on increasing reading and writing skills or on increasing the amount of information exchanged using a number of "materials"?

I have no ideas about the nature of utopia, but a rational literacy program would focus on increasing the amount of printed information exchanged per unit of effort spent on literacy.

6. Since the model calls for knowledge of the "number of materials," what is "a material"? Is it a word, a sentence, a paragraph, a book?

It means just what English-speaking people ordinarily think it means. When we get down to implementing the model, we can pick the nits out of that concept.

> 7. Is the relationship between the comprehensibility of "a material" and the reading ability of the person reading it one of independence or interdependence?

I am not certain that I understand the intent of this question. Interpreting it literally would seem to imply that Professor Merwin believes that a person's score on a reading achievement test might stand at one level when he is reading one material, move to another level when he picks up and starts reading a second material, and then revert to its former level if he puts down the second material and resumes reading the first. I suspect, however, that he meant to ask if reading achievement scores interact with the mean level of students' comprehensibility test scores when those two variables are used to predict individuals' scores on a comprehensibility test. I have recently been analyzing some data that show that they most certainly do, to a slight but reliable extent. But now that I have answered the question, I confess that I cannot understand its implications, unless they are that isoliteracy lines, as illustrated in Figure 2, (p. 30) might cross, leading to embarrassing intransitivities in reaching decisions. The answer to that question is that the data indicate strongly that the isoliteracy lines do not cross in the observable (as opposed to merely the observed) ranges of the tests involved.

> 8. Are the development of reading and writing skills independent, or might one be enhanced by instruction aimed at the other?

They are interdependent, of course, and this will present accountants with some problems when it comes to estimating the parameters of the cost function in the model. By themselves, accountants might have trouble in allocating the costs involved. But I am astonished that an educational psychologist would think that this presents any real problem for instrumenting the model. If there is one thing that educational psychologists are really good at, it is ferreting out and estimating the size of transfer of training effects.

> 9. What is the relationship between the development of one's "literacy" and one's ability to exchange information in ways that do not involve reading and writing?

Literacy is just one mode of communication, and literacy policy can become fully rational only if it is ultimately viewed in its proper context as being just one part of communication policy. Then, could we not place all communication policy on a rational basis by suitably generalizing the model of the literacy program described in my paper? The answer, of course, is *yes*, provided that someone is willing to devote his life to doing so and provided that we first break the ground for him by developing the model for the literacy program.

Now, let us take up Professor Merwin's technical questions.

> 1. How are units of "ability" and "comprehensibility" to be selected to meet the requirement of the model that they be additive to get units of "information" $(I = A + C)$?

As I introduced the model in the section entitled *Further Specification of the Model*, I said, "However, in doing so we will ignore intercept and slope constants, *interactions*, and nonlinearities partly for the sake of clarity . . . and partly because *they are not essential for the immediate* uses we will be making of the model" (emphasis added). In other words, I acknowledged that ability and comprehensibility could interact and therefore not allow those two variables to be strictly additive. One reason that I did so was that I had just finished calculating this function and knew that they do interact, but I had also evaluated that function, knew that the isoliteracy lines (Figure 2, p. 30), did not intersect in the observable (not merely the observed) range of the test scores, knew that the resulting uses of this function would not lead to intransitive orderings of alternative policies, and so felt confident to add the assurance in italics.

Also, I should add that the units in which ability and comprehensibility are measured are only casually related to the question of whether these variables are additive. This production function is nothing more esoteric than a multiple regression equation. The slope constants attached to A and C, therefore, automatically convert those two measures to equivalent units of I. The units of measuring A and C influence additivity only if either or both of those two variables are not linearly related to I. That minor inconvenience is easily solved merely by selecting transformations that will effectively linearize those regressions.

2. How does one develop meaningful measures of comprehensibility and ability to read that have the orthogonal relationship seemingly required for the model?

I believe I have just answered this question. I wish I were, instead, asked, "How does one obtain the comparable measures of comprehensibility required by the model?" That would have given me the opportunity to mount another favorite soapbox of mine and to proclaim the wonders to be achieved by using algorithmically generated questions and the cloze procedure.

3. How does one meaningfully equate the outcomes of a dollar spent on reading instruction and a dollar spent on writing instruction?

The answer, in terms of the geometric presentation used in this paper, is to locate the equilibrium point $\underline{P}$ (Figure 2, p. 30)--or, to put it in mathematical terms, by taking the partial derivates of Equations 8 and 9 to form a system of equations, by calling forth the Legrange multipliers necessary to solve this system, by setting all partial derivates equal to 0 in order to maximize the system relative to $\underline{I}$, and then by solving simultaneously to obtain the values of $\underline{A}$ and $\underline{C}$. Those values of $\underline{A}$ and $\underline{C}$ must, therefore, correspond to $\underline{a}$ and $\underline{c}$ in Figure 2 and define the equilibrium point $\underline{P}$.

4. If a small number of people will produce a very large portion of the materials to read, is it desirable to split the resources spent on every individual half and half on reading and writing?

This returns to the opening question, which need not be elaborated on again.

I would like to thank Professor Merwin for his willingness to undertake the task of commenting on this paper and for the opportunity to reemphasize some of its points. It is a long and detailed paper and lies only partially within the field of educational psychology. I found his questions not only numerous but also interesting. I am sure that many who have heard and will read this paper will have raised many of the same questions.

Perspectives on Language and Cognition

INTRODUCTION *Roger Shuy's paper* focuses on the whole issue of functional language as it relates to the literacy problem--in particular, understanding written discourse. Through the use of natural language examples, Shuy examines the distinction between literal messages in speech acts and their functional role. He points out that readers need to take into account the pragmatic as well as the literal intent of messages. While he casts his comments in the context of speech act theory and the pragmatics of natural language, his account of the function of speech acts is consistent with the whole issue of inferencing as it has been treated by cognitive psychologists who are dealing with schema theory. For example, he argues that the inferences involved in reading comprehension--those inferences which are necessary to understand the intent of the message--go far beyond the parameters of the logic of the message itself.

Walter Loban's wide-ranging paper serves to emphasize the fundamental principle that language instruction must be, above all, functional and not an end in itself. Teaching literacy skills will not be enhanced by providing students with information about language, but rather by choreographing classroom experiences in which language can be used meaningfully, in which intuitive powers can be unconsciously applied and refined. Loban describes a continuum of literacy skills ranging from the minimal abilities of 12-year-olds in adequate school systems to the prowess of major political and literary figures. He claims that the goal of literacy has never been advanced by instruction in grammar, nor by emphasis on the essentially peripheral concerns of standard usage. Instead, Loban advocates allowing students to write and speak in order to influence actual audiences. Beyond the acquisition of elemental decoding skills, reading activities should also take the form of motivating, communicative exercises.

Although literacy is generally conceived of as a matter of reading and writing, Loban reminds us that these activities must be based on children's facility with oral language. The model of reading developed in this paper postulates that comprehension is achieved primarily by confirming hypotheses based on structural and semantic expectancies, not by a detailed word-by-word decoding process. Since early readers' expectancies are grounded in their oral language habits, literacy instruction must not ignore the importance of students' speaking abilities.

Amy Sheldon's response cautions against the assumption that grammars of any kind are psychologically real or that children come to school having already mastered full knowledge of their language. While conceding that instruction in formalisms and arcane terminology is pointless, Sheldon contends that linguistic insights concerning paraphrase, ambiguity, and stylistic mechanisms must be imparted to students in order to increase children's expressive ranges. To support her argument, she reviews selected research pointing to the importance of semantic context and prior knowledge in the reading process. Noting that context is inherently limited in written language, and that children frequently have only limited knowledge of the world, she suggests that knowledge of grammar may be especially important for early readers. Her final remarks on the need for more research concerning individual differences in language development as they affect literacy skills seem most significant.

According to Andrew MacLeish, the functional view of language promulgated by Loban carries with it some confusion concerning just what the nature of language is. "Language" may refer to a set of skills or to speech habits or to rhetoric and editorial conventions. MacLeish believes that it is necessary to know about language, but, with Sheldon, asserts that this need not entail teaching students how to construct systems of grammar. Nevertheless, MacLeish concludes that distinctions between competence and performance must be maintained in conceptualizing what it is that students must know.

The pervading force of E. Tory Higgins's contribution to this conference, "Written Communication as Functional Literacy: A Developmental Comparison of Oral and Written Communication," is to extend the conception of literacy skills beyond the rudimentary requisites of symbol identification. Most notably, Higgins discusses literacy within a communicative perspective, a perspective which highlights the function of discourse in interpersonal contexts. The paper reviews research which charts developmental gains in the ability to formulate useful messages within the context of a circumscribed task. As Higgins remarks, this type of functional assessment paradigm may provide a model for future literacy evaluation programs. More significantly, this body of research documents that the ability to perceive the informational needs of message receivers is a factor contributing to growth in functional literacy which must be considered along with more traditional concerns for linguistic development.

Higgins's work points to a surprising interaction between age and mode of communication. Younger students were found to perform better in the written mode, while older students supplied more useful information in the oral mode. He accounts for this phenomenon by postulating that young children need to capitalize on the opportunity for message review accorded by the permanency of writing. When memory is enhanced by means of external devices, differences between modes disappear. Here the import of Higgins's analysis is to stress the dependency of underlying communicative intent on cognitive processing limitations.

In response, Robert Scott underscores an implicit assumption in Higgins's work: that the functionally literate encoder constructs a representation of the world by selecting and amplifying information about the world in a fashion which is constrained by the expectations and conventions of social interaction. Scott criticizes much of the work reported by Higgins for its failure to simulate closely enough naturalistic social contexts. He suggests that some experimental procedures may tend to deemphasize oral-written channel differences by artificially restricting the dialogical nature of spoken communication. Nevertheless, Scott echoes Higgins's call for infusing the communicative, social-interactional perspective into instruction for literacy.

Andrew Collins's response to Higgins's paper takes a very different tack. Just as Higgins stresses the underlying similarity of spoken and written discourse, so does Collins suggest an essential correspondence between the decoding demands of discourse as traditionally conceived and those of televised popular entertainment. Collins speaks to the pervasive belief that television is detrimental to the development of literacy skills and reviews considerable literature that fails to support that supposition. He further discusses recent studies of developmental differences in how televised narratives are comprehended. His provocative conclusion is that skills needed for making inferences about popular television programming, particularly skill in discriminating central from peripheral information and in constructing inferences linking discontinuous segments, are quite similar to the processing requirements of all decoding activities. Suggestions for using televised material to accelerate growth in literacy, broadly conceived, are included in this response.

WHAT CHILDREN'S FUNCTIONAL LANGUAGE CAN TELL US ABOUT READING, OR, HOW JOANNA GOT HERSELF INVITED TO DINNER

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One common approach to beginning a paper is to tell a story which deals, at least remotely, with the topic and leads toward later clarity. Alternatively, one can start with a clear definition of the key words in the title--in this case, functional language and reading. However, as easy as this sounds, it is anything but a simple matter. Reading might be defined, for example, as "getting meaning from the printed page," "getting the same meaning that the author intended from the printed page," "decoding written language by way of spoken language," or in many other ways. Something is wrong with these caricatures of reading and with every other definition I have encountered. Likewise, functional language competence might be defined as the underlying knowledge that people have that allows them to use their language to make utterances in order to accomplish goals and to understand the utterances of others in terms of their goals. It includes a knowledge of what kinds of goals language can accomplish (the functions of language) and what utterances are permissible to accomplish each function (language strategies). However accurate such a definition may be, on the other hand, it simply does not set the stage for productive thinking about functional language as well as the following anecdote does.

Joanna is a 5-year-old who lives across the street from us. She has two teenage sisters and her parents are State Department people who are trilingual. To say the least, Joanna comes from a language-rich environment. At 6:00 one summer evening a few years ago, Joanna rang our doorbell. When I answered she said, "Mr. Shuy, if you will look across the street you will see that both of our cars are gone." I looked across the street and replied, "Sure enough, Joanna, you're right." Then she said, "And you know, Mr. Shuy, my mother worries if I miss meals." Sensing an urgent need, I invited Joanna in. She stood for a moment in the entry hall and said, "You know, Mr. Shuy, I eat almost anything." In three indirect sentences, Joanna had progressed from our front door to the dinner table, without once directly requesting a single thing. This is what I mean by functional language. Joanna used language to make utterances in order to accomplish goals. I understood her utterances in terms of these goals. We both knew what goals language could accomplish (the functions of language) and we both understood what utterances were permissible to accomplish them (language strategies).

To this point, we have illustrated and semi-defined language functions. Whatever the receptor's learning style or preference, some notion of language functions should be clear. In this instance, the function of "getting oneself invited" could have been accomplished through various strategies such as performatives, direct imperatives, wh-imperatives, or statements. Joanna avoided performatives ("Mr. Shuy, I order you to invite me to dinner") or direct imperatives ("Give me something to eat"). Instead, she resorted to utterances which grow out of the strategy of using statements.

Functional language competence also accounts for knowing what utterances cannot do. In English, uttering the statement "You are a frog" does not turn the listener into a frog. In the United States, at least, the words "I divorce you" do not constitute the completion of divorce proceedings, but "I christen you John" does work to christen a child. Likewise, if a teacher tells a student, "You have one minute to get over here," the utterance can act as an order; but if the student says the same thing to the teacher, such a meaning is, at best, farfetched.

This very sketchy and incomplete discussion of some aspects of functional language competence shows that a speaker's underlying knowledge must be extensive and complex. In the literature of linguistics, sociolinguistics, and philosophy, at least three other terms are also used to refer to functional language competence: communicative competence, pragmatics of natural language, and speech act competence. All who have studied this phenomenon agree that language users cannot possibly learn and store in memory all of the complexities of functions, strategies, and utterances as item lists any more than they can store phonological or grammatical language as item lists. This knowledge must be learned and stored according to organizational principles. These principles may be considered constitutive rules which account for the successes and failures in utterances meant as promises, for example, but they also separate promises from orders or requests for information. In a similar manner, the constitutive rules of football not only account for the successes or failures of particular plays but also for football being football and not baseball or soccer.

Functional language competence is relevant to reading in several ways. The rest of this paper will be dedicated to suggesting implications of the knowledge of functional language to the diagnosis of reading ability, both to that which interferes with reading ability and that which develops it. In addition, the paper will focus on some of the special problems of culturally and linguistically different children as these relate to functional language ability.

In order to relate a child's functional language ability to the process of learning to read, it is necessary either to establish or hypothesize an adequate developmental theory of reading. That is, it should be possible to state accurately that children call on certain skills, acquire certain concepts, or go through certain processes with some predictable regularity. The field of reading is more characterized by models than by theories, perhaps reflecting the fact that relatively little useful research has been accomplished which can demonstrate the important underpinnings for an acceptable developmental theory. This seems particularly troublesome because all pedagogical materials assume a natural progression of some sort, often (if not usually) without a solid research base. In that sense of the term, there is at least an implied developmental hypothesis or model at work.

One model assumes that phonology is the key to reading and that letter-sound correspondences will unlock the entire mystery. Another model rejects phonology, building instead on lexicon, indicating that reading is a process of piling up word after word. Other models build bridges between sounds and letters, some focusing on syllables and others on what C. C. Fries referred to as spelling patterns. It will not be our purpose here to elaborate or to criticize these models. Children have apparently learned to read using materials built around these models. Of more concern to us here is the fact that each of these models--whether based on phonology, morphology, or lexicon--is, by itself, an incomplete picture of the inventory of even the language accesses to reading, to say nothing of the accesses which go beyond language.

A theory of reading should account for language in the many ways it reveals itself developmentally. In at least one sense of the term, reading can be viewed in a timeframe continuum in which early skills are developed, paradoxically, only to be automated and defocused as soon as possible in favor of more advanced cognitive processes. Reading offers a rather clear example of a mixture of such early behavioral skills, later cognitive strategies, and a potential for cultural interpretation and individual learning style. Elsewhere I have hypothesized an acquisitional sequence of the language accesses in reading (Shuy, 1975).

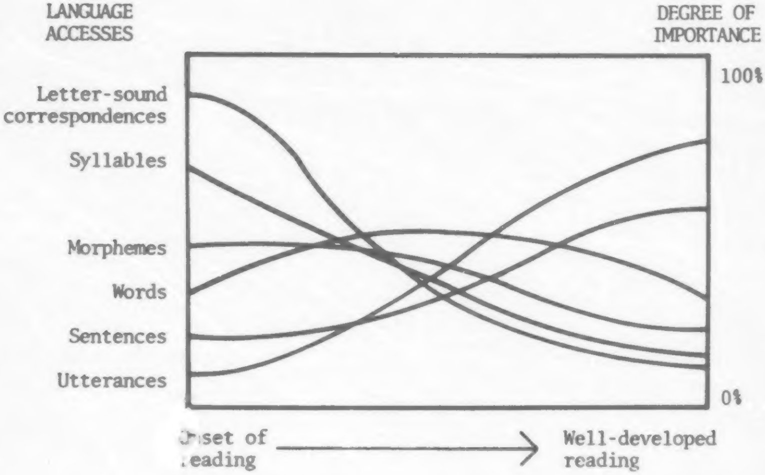


Figure 1. Language accesses in reading development.

Figure 1 can be thought to represent a theory of reading in which the various language accesses to reading (letter-sound correspondence, syllables, etc.) are of different degrees of importance to the process of learning to read at different stages in the developmental process. That is, letter-sound correspondence seems to be of high importance to the individual reader at the onset of reading (as a rather behavioral "starting" skill) but grows less critical and becomes less focused as the reader becomes more and more proficient. Good readers do not read letter by letter; they process by larger and larger units, up to and including larger units of discourse. On the other hand, it should be noted that utterance does not refer specifically to size. The utterance may be a group of sentences, a single sentence, or even less than a sentence. It is as big or as large as the meaning requires. It includes as much context, linguistic or supralinguistic, as is needed for interpretation. Such a theory argues for moving immediately toward meaning in reading and for all learning to take place in realistic meaning contexts (i.e., no study of letters in isolation from meaning units). There has been some disagreement among reputable scholars on exactly how this movement toward meaning and realistic meaning context is to be carried out. Some argue that it is better to start to read whole sentences, for meaning is thought to be most significant at the syntactic level. Others argue that meaning exists as far down as the morpheme level, and although it is important to develop materials which are found in realistic language contexts, the scholars would disagree with those who would totally abandon decoding.

Learning theory has long held that different kinds of learning can take place at different stages of learning. Thus behavioral, skill-focused learning can be adequate in the early stages of reading but should be replaced as soon as possible by more cognitive strategies (i.e., those involving meaning). For some critics, this means sentences. I would argue that for the typical cooperative child who will accept the fact that certain dull or odd things must be done in order to get to later, more interesting things, almost any reading approach can be successful. Some children may be ready to accept such behavioral (letter-sound type) instruction earlier or later than others. Some sort of diagnostic instrument should be able to predict who such children are. It seems likely, in fact, that one aspect of such a prediction will be based on the child's personality more than on the reading tasks or on the language accesses themselves.

This lengthy detour away from our description of children's functional language is necessary in order to display this language access to reading in relationship to the other accesses. It should be stressed that the model in Figure 1 is in no way a reflection of extant research. It is, instead, one hypothesis about how important these various language accesses are to the reader. Perhaps more important, it displays the possibility that a given reader may call on these accesses in different degrees at different stages of development. Whether or not these degrees of importance are accurate, this is generally what a developmental theory of reading should be able to display.

The theory of reading depicted here contrasts with other theories which are represented by stages (e.g., Chall, 1976) or by flow charts (e.g., Venezky & Massaro, 1976). These latter theories posit discrete stages or positions which children pass through in learning to read. If sociolinguistics has taught us anything, it has instructed us that variability is common, that a continuum describes language better than discrete stages, and that diagnosis or evaluation should be preceded by observation. Much of reading theory ignores these tenets and assumes that a reader passes through stages or flow-chart-like processes. A sociolinguistic view of reading allows for the possibility of a continuum rather than discrete stages, permits a high degree of variability in the production of reading, accounts for social factors as influences on the reading process, and attempts to develop an inventory of individualizing features which can be observed by the teacher in order to diagnose, evaluate, and prescribe.

Such a view of reading says, in essence, that teaching is not a rote, mechanical process like turning a bolt on an assembly line. There is not a single best method of teaching reading which, once mastered, will make classroom efforts easier. All children do not progress similarly and they do not move from one stage to another in an orderly fashion. The environment in which reading is learned is not constant and may turn out to be a decisive factor in the child's learning.

What a linguistic view of reading does assert is that there are many language accesses to reading and that these accesses are, in themselves, not methods. That letter-sound correspondences are useful at the onset of reading must be seen in the context of other accesses to reading which, though less crucial then, will soon become more crucial as the reader improves.

The place of meaning in learning to read has been hypothesized in the model (Figure 1) at the lower end of the list of accesses. Utterance reading is not highly critical to the beginning reader as a tool for building reading competence, although effective learning can be impeded by instruction or materials which do not attend to it. It is not difficult to find instances in early reading materials which, in their effort to avoid long sentences, increase the pressure on inferencing and pragmatic processing. The following example, selected by Freeman in her research (Larkin, Freeman, Humphrey, & Yanofsky, 1976), may be illustrative:

> Jasper had a problem. Everyone got
> bigger but no one would tell him how.

The potential difficulty with this utterance is that of relating the second sentence to the word problem in the first. The meaning is unclear because of the nonspecification of the how clause, which some would say is deletion. In her work on primer texts related to our child language project, Freeman has found examples like the following. One supplemental reading series highlights a character named "Encyclopedia" Brown. The test explains, at the beginning:

> His head was like an encyclopedia.
> It was full of facts.

The intersentential relationships necessary for understanding that "like an encyclopedia" relates to "full of facts" are complicated. The child must learn that his head is not colored blue or bound in morocco leather. These two short sentences require inferential reading skills which may well exceed the complication of syntactic embedding. The function of the second sentence is clearly to explain the first.

If it is true that such utterance processing at the early stages of reading can cause difficulties, it is equally true that as learners improve their ability to read, they somehow learn to call on and trust their functional language use more and more. The simple truth is that the teaching of reading does not address ways of processing utterances which contribute to this ability. Worse still, the generally held classroom concept of reading can even work against calling on functional language use in this way. In a classroom in which we have been doing research on functional language, Griffin (1977) notes that the following scene took place:

> Grant (reading aloud): The...pigeon... flew...far...a...
>
> Teacher: Just think. Think what it would say. The pigeon flew far? (in a very sprightly tone)
>
> Grant: far...far a-... (mumbling) away.
>
> Gene (drowning out Grant's mumbling: A,... A says its name! Away!
>
> Teacher (not hearing Grant): That's right, Gene, A does say its own name. Two A's say their name, a way!

This scene was particularly interesting since the teacher had actually structured the question in such a way that Grant could call on his everyday knowledge of sentences and utterances to predict the difficult word. He actually did this but his timing was bad. Gene, realizing that reading-group language was appropriate, called out a phonics generalization, using what had been taught about same letter-sound correspondences--his special school knowledge, not his everyday language. The teacher then permitted the good question to be reinterpreted as being about decoding language rather than comprehension. Grant's fine effort to call on his ability to understand the utterances of others to use language to accomplish certain goals was sidetracked by a less important but more visible skill.

Why does even a good teacher let this happen? Partly, at least, because education places a high premium on the visible, quantifiable, surface aspects of its work. In the teaching of language as well as reading, for example, it is considerably easier to measure accuracy in pronunciation or vocabulary than in meaning. The typical evaluation points in language measurement may be likened to an iceberg with the visible features above the waterline but the more critical ones below (Figure 2).

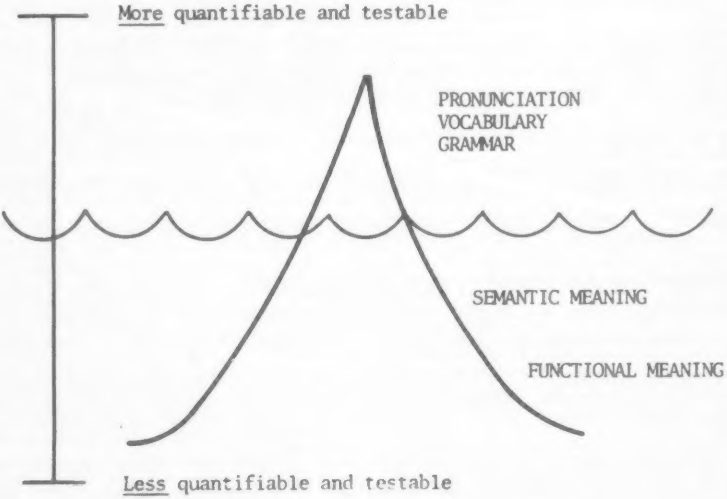


Figure 2. Evaluation points of language.

What typically happens in the measurement of language learning ability as well as reading ability is that the more visible, highly recurring features (vocabulary, pronunciation, and sometimes grammar for language learning and letter-sound correspondences and whole words or decoding strategies for reading) are measured and quantified throughout the learning program *without regard for their interrelationships with the other accompanying measurement points*. These features are measurable because their inventory is reasonable to assess and because we know what they are, more than because of what they tell us about language learning ability or reading ability. Because such features recur, they are easily quantifiable, thus lending an air of scientific respectability. When couched as test questions, such features become discrete-point test items, and it is assumed that by knowing the answer to such questions, one evidences significant ability in the gestalts of language or reading.

The next easy step to take, once one has progressed dubiously this far, is to assume that because a feature measures something meaningful at one stage, it can be measured continuously for that same meaning. The absurdity of such an assumption is apparent in reading in particular, where the usefulness of measuring letter-sound correspondences as an indication of reading ability becomes more and more doubtful as the learner becomes less and less conscious of this skill. Some early learning skills are important at some stages but potentially harmful to keep in conscious awareness beyond these stages. It is obvious, for example, that one does not remain aware of exactly what one is doing while one walks or drives a car--but particularly of the early skills involved in such strategies.

Any attempt to quantify a child's ability to respond to questions related to letter-sound correspondences in reading after that child has progressed to rather advanced stages of reading ability, therefore, runs the risk of measuring an irrelevant ability--one which is being necessarily submerged in the child's consciousness in favor of more cognitive later-learning strategies. If advanced children continue to do well on such efforts to measure their ability, the gains may be only a result of their ability to become good test takers as well.

Not only can language data be quantified to probe into a person's individual differences or to generalize his or her group memberships, therefore, it can also display misleading but easily isolable information which may, in the long run, prove more harmful than beneficial.

The question remains how to develop in young readers the ability to make use of their functional language competence to process language in larger and larger linguistic chunks and then to figure out the right size of chunks needed. Intuitively we know that good readers must do this, for the skills they are taught (word level or lower) can only serve to slow down later efficient reading. The fantastic redundance which the printed page offers readers can only become a handicap if they feel compelled to process it all. What, then, are the units that may be skipped? Since it seems clear that readers predict what they do not know on the basis of what they do know, it would seem appropriate to make use of predictable contexts, even clichés, in early reading situations. More important, it would seem appropriate to avoid unpredictable contexts, such as figures of speech, metaphors, or unknown concepts at such a stage in reading acquisition. Few existing reading programs ask the reader to call on context clues in any positive, constructive way. Most programs could benefit even from knowing how to avoid counterproductive contexts.

In order to process utterances, readers must know not only the form of sentences but also their appropriate use. In addition, they must also understand the relationship between sentences which are formally syntactically and semantically distinct. When the linguistic context of reading materials is reduced in length, the clues to utterance meaning are reduced, and the reading is made more difficult. As might have been expected, this principle was recognized in practice long before it was articulated in theory. It was recognized, for example, that reading materials which contained sentences such as "Run, Spot, run!" were so unlike a child's natural language as to be unpredictable. Many of the earlier versions of children's reading materials have been improved significantly in response to this realization. Larkin's research (Larkin et al., 1976) in utterance meaning cites many extant incidents, however. One child, for example, was seen to have difficulty with the final sentence in this set:

> Hello, Jane.
>
> Hello, Bob.
>
> Hello, hello.

The first two sentences are consonant with real, predictable speech. The last sentence is a totally unpredictable utterance even though the lexicon apparently had not posed a problem. The fact that the child stumbled on the last sentence can be traced to his thwarted effort to process the utterance function of the passage. The goal to be accomplished by language was not apparent to the reader. In order to use language to get things done (as Joanna did when she visited my house) or to provide an effective greeting, as "Hello, hello" apparently fails to do so, the participants in the communication call on their knowledge both of how language works and how the world works.

In contrast to this sort of pedagogical repetition utilized by the authors of the preceding passage is the following incident. In one of the classrooms in which we are doing research it was story reading time. As the teacher read the story, the children were periodically shown the pictures in the book. This instanced the predication game. In one well-known folktale, the text read, "Hit, stick, hit!" At this point the teacher turned the book around for the class to see the picture. One child asked, "Hit what?" Others chimed in, "Hit the innkeeper." Of course, this was exactly right. The children were predicting, inferencing, calling on what they knew about language and the real world to put the story in a context. As far as we know, nobody ever referred to this incident as comprehension or reading. It is our opinion that it is closely related.

The types of repetition involved in these two incidents are noteworthy. The first type, what I have referred to as pedagogical repetition, yields unpredictable texts and, in some cases, reading failure. The reader cannot call on what he or she knows about how language works or about how the world works to solve the problem and read the passage. In the second incident, however, the repetition is not merely for the sake of pedagogy, but rather grows out of a functional literary purpose. As the incident shows, there was no problem with the children's ability to inference, even though the natural prediction would have been to assume that stick is the object. The problem, then, is not with repetition per se but rather with the wrong use of repetition. Pedagogy has assumed that repetition is good. Perhaps this is true in some cases but not always so with regard to reading. Simplistic readability formulas overlook the fact that some types of repetition are functional and others pedagogical. The latter may be unmotivated linguistically and, more critical, may hamper comprehension. Our Washington research group, including Peg Griffin, Don Larkin, Cecilia Freeman, Nancy Yanofsky and Frank Humphrey, has been addressing issues of this sort in various research projects.

In a recent paper on pragmatics, Griffin (1977) points out some obvious but little realized things which the act of reading can accomplish. One important contribution of linguistics to reading has been that through reading language is thought to provide an access to new knowledge. Griffin suggests still another unlocking process, one which more clearly evidences the influence of pragmatics in reading. In an informal experiment, Griffin first had subjects read the following sentences:

> "Have you traveled much since you came to the Philippines?" Elsa asked Carol.
>
> "Well, just in Cebu Province. I went to Danao and Moalboal last month and last week I visited some friends in Talisay," Carol answered.

Many accomplished readers of English do not know the names of three towns in the province of Cebu in the Philippines. Before the reading task, subjects were asked to name three towns in the Philippines. If the three in the reading passage or any other actual towns were named, the subject was rejected. Then the passage was offered to the remaining subjects. After reading it, the subjects could name all three noted in the passage despite the fact that the passage at no point identifies them as towns. The places named could be, for example, parts of one town for all the passage actually tells us. If the words of the passage do not tell the readers that the three cities are in Cebu Province, how did the readers learn this? Obviously they called on what they knew about how English works in such cases. They called on their functional language competence to learn something which an approach based on componential analysis of the passage does not teach. The experiment demonstrates that reading can add to the reader's store of facts about the world that enter his or her knowledge base by means of language use rather than by some sort of componential semantics.

Not only can readers acquire knowledge about the real world through language use, but it would also appear obvious that knowledge of the facts about language use in the real world is useful if not necessary for good reading. The readers in the Griffin experiment learned something that was not otherwise made explicit primarily by means of their knowledge of language use. Why not encapsulate such knowledge in the development of a reading program? Language users do not have to depend on outright statements, nor do they require or expect lengthy ones. In reading, as in normal oral language, there is much that is left unsaid.

Such information is often implied by what is said and is often filled in by the reader in terms of his or her background knowledge of the real world.

One problem in developing context processing skills in readers is in getting the children to know where to look for critical information or clues. Elsewhere I have urged (Shuy, 1975) that for the early stages of reading, exercises such as the following be developed to consciously train readers to plow through the mass of redundant information and select only the minimal clues for processing. The examples are not excellent ones but they serve to illustrate the point.

> The sailors were getting their ______________
> ready for winter storage.
>
> wet
> and
> planes
> cars
> boats

The students' task is to circle the word which best fits the blank and then draw an arrow from it to the word in the sentence which motivated their selection. Naturally, it would be possible to believe that sailors might ready their *cars* or *planes* for winter storage, but this choice is less predictable than *boats*. The other two choices, *and* and *wet*, are excluded on grammatical grounds. Such a procedure, of course, is very much like the cloze procedure which, to this point, has been used primarily for testing rather than for training.

Practice in exercises such as this (or improved versions thereof) should train the reader to sense and connect larger and larger units of written language. Similar exercises could be developed to train readers to see the necessary discourse markers as framing units. The underlined words in the following paragraph make this obvious.

> The *first* thing he needed to do was to buy a bike. *Then* he could enter the parade and maybe, just maybe, he would *someday* win the prize.

We have known for some time that compositions are framed with discourse markers of various sorts, depending on the style. Narratives contain time markers (*first*, *next*, *secondly*, etc.). Descriptive writing contains units such as "on one side of the room" and "on the other side" which serve as beacons to light the reader's path. Expository prose contains predictable introductory phrases, continuation markers and summary expressions.

Discourse processing skills are seldom if ever developed directly as part of a reading program. How, then, do children learn them? As part of one of the research projects, we have discovered that inferencing skills are often interfered with rather than assisted in many reading programs. Freeman (Larkin et al., 1976) cites an example from a widely used reading program, as follows:

> Lucy was a busy worker. She painted many pretty pictures. But Lucy had one problem. She didn't listen.

There is no syntactic connection between the last sentence and the penultimate one. Yet a great deal hinges on the reader's ability to understand that the entire last sentence explains or substitutes for the word problem.

The same reading series also plays a bit loose with pronoun reference clarity. The story explains that one day Lucy was painting and the teacher told the class to go to the library. Lucy did not listen and suddenly found herself in an empty room. She thought the class had all gone to lunch, so she went to her locker to get her lunch and met her friend, Mary. At this point the text reads:

> Mary saw Lucy with her lunch bag.

A great deal of context is left out here. One can only infer that the lunch, whoever it belonged to, is in a bag and that Lucy had fetched her own and not Mary's lunch. (Perhaps the story would be more interesting if the lunch were really Mary's and Mary caught Lucy redhanded.) We still do not know exactly what goes on in the reader's mind as he or she learns to process utterances in writing. Undoubtedly, different readers do different things with different types of text. The question here is simply that something is going on, that utterance processing is probably involved, and that materials development projects could easily benefit from linguistic research in this area.

Readability formulas in reading are not that sophisticated, still being based on the assumption that shorter is easier than longer. The chances are that real readability, at least for nonbeginners, has less to do with length than it does with sentence and discourse reading processes. In some cases, in fact, it may be that the words of the famous architect apply even to language, which sometimes evidences the truth "Less is more."

Our research project on children's functional language has also revealed that inferencing skills, based on the child's knowledge of how language works and how the world works, are often more clearly evident in nonreading class environments than in the reading classes themselves. The children Griffin observed, for example, learned that menu writing is done in a certain way in order to get things done with words. They learned to accept this as a fact of life and to read a menu from that perspective. There are space conventions for menus which make abbreviations tolerable. Thus, one day, when *Rat Beef Sandwiches* appeared on the menu, the children were amused but not disgusted. They knew enough about the real world to know that they would not be fed rats and that the abbreviation system had simply not worked efficiently. Nor were they daunted by their teacher's suggestion that *rot beef sandwiches* might be better. They all knew that the intention of the cook was *roast beef*. They knew this from past experience and from the linguistic environment.

One last incident from the research project evidences the inability of a class to call on their functional language ability to relate it to reading. Recipes call for a reading ability which is somewhat different from other forms of literacy. Recipes sometimes contain a list of ingredients followed by some prose about what to do with the items. In one class the children read the list "vanilla, eggs, flour, sugar," etc. Then they continued to list-read the prose. This resulted in the sentence: "Put in a cup." The teacher laughed. Why would you want to put a cup into a mixing bowl? But the children did not laugh. They were not reading discourse; they were reading words. They were not focusing on the goal to be accomplished by language. They were not calling on their functional language competence. One exception in this class was Julie. The teacher then picked up the cookbook and read the instructions for a while, and gave it back to the class:

Teacher: The next instruction is pretty hard. Do you want to try it Sophia?

Sophia: Mix..., Mix...

Teacher: That's a hard word. Can anyone get it?

Julie: Throughly /θruwliy/

Teacher: Not quite. Anyone else?

Erin: Thoroughly /θərowliy/

Teacher: Right! Does anyone know what that means?

Erin: Very, very quickly.

Teacher: No.

Julie: All the way through.

Julie had not decoded the word properly. She was too busy processing the meaning, as was evident from her ability to define the word and to let the meaning dictate the decoding. She called on what she knew about cooking and language to read the recipe. Little more could be asked.

As noted earlier, applications of knowledge of how functions of language work can also enable a teacher to interpret apparent misreadings appropriately. This is even more critical in bilingual situations. The most prominent occasions in which such diagnoses might be made concern comprehension questions. If teacher requests are made, for example, with strategies which have not yet been acquired, confusion is apt to result. The meaning of the teacher's utterance, regardless of how well intentioned it might be, must be expressed in terms of both the semantic and pragmatic meaning system of the child. There is insufficient material provided to teachers regarding any kind of language competence, and problems in the educational setting arise from a failure to apply information about a teacher's and a child's functional language competence. Other resource information is inappropriately applied, due in part to this gap in the teacher's resources. This scenario was observed during an outside free play activity among 4-year-olds:

> Three boys are in a fairly separate area of the play yard with a teacher observing the action. The first child had brought a very nice glider to school. The rule is that when toys are brought from home they must be shared or left in the child's cubbyhole. The first and the second child are playing freely with the glider. The third child is not playing. Finally the third child sees the glider and goes to retrieve it. The first child runs faster and picks it up

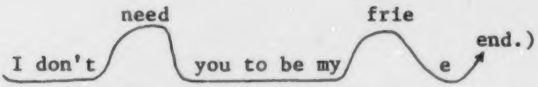
quickly. The following conversation ensues:

Third Child: I want a turn. Can I have a turn? I want a turn. Let me have a turn.

First Child: Look, I'd let you have a turn but you dropped it. You'll break it.

Third Child: If you let me have a turn, I'll (pause) I'll be your friend.

First Child: I don't need you to be my friend. (Intonation:



The teacher then addresses the first child and talks to him about everyone needing friends and about sharing toys. After some discussion of these values, she gives him the option of returning the toy to his cubby or letting the third child play with it after the first child tells him some rules about it. Then:

First Child: Say you won't drop it and break it.

Third Child: I won't drop it. I won't break it.

The teacher and the observer discussed the incident later. From the teacher's actions and discussion it became clear that she did not notice that the third child had experienced and exhibited a problem in functional language competence. He was trying to make a promise using a conditional statement strategy and was unable to carry it off successfully. The first child located the problem--a promise has to involve what the addressee perceives as valuable, and in this case the general childhood value of having friends was not specific enough. What the first child "needed" was to hear in the promise that the third child would not drop and break the glider. Instead of being rewarded for attempting to assist his peer in developing functional language competence, the child was rebuked for global socialization offenses (i.e., not sharing, being exclusive in friendships). What the third child needed was some assistance in developing a new strategy for making promises; instead, he was allowed to ignore this need and to play with the glider anyway. What the teacher needed was some information about the language functions, strategies, expected developmental sequences, and teacher strategies that foster development of functional language competence. The teacher also would be benefited from applicational assistance--some practice observing children's language behavior, hypothesizing on the causes of certain behavior, and planning, implementing, and evaluating teacher strategies that capitalize on those aspects of the educational setting that encourage the development of functional language competence.

It appears that language functions, unlike phonology and grammar, are developmental almost throughout one's life. Few adults, for example, ever become proficient at the language function of condoling. For the sake of survival, children learn how to take turns in school settings appropriately rather early, as the recent work of Humphrey and Ottesen (in preparation) clearly shows. They learn that turn taking is complex and often asymmetrical (teachers regularly assign turns and get more turns than children; on the other hand, they can be overlapped by children without the child overlapper having the responsibility to repair). One also learns how to avoid being interrupted, how to interrupt, how to refuse, how to clarify, and how to obfuscate with dignity. What may be considered rudeness may be only an imperfectly developed sense of interruption skills. It would seem critical for teachers to be able to distinguish between these matters.

I have attempted to make a strong case for the examination of functional language competence in the teaching of reading. To see where functional language fits in the spectrum of reading, it was first necessary to develop a theory of developmental reading. Although research in this area is still in its early stages, the concept of functional language offers explanatory power and suggests avenues for avoiding pitfalls in the early teaching of reading, along with positive suggestions for building a middle-level reading program. Functional language competence also serves as a reference point for cross-cultural reading and language acquisition, particularly as it relates to legislative mandates involving "effective participation in the classroom." What research has told us so far, unfortunately, is that the assessment of language functions is a very complex matter and that even such apparently simple notions such as seeking clarification overlaps many functions at the same time. Nevertheless, the notion is an exciting one, and maybe someday we will learn something about how Joanna actually got herself invited to dinner.

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RELATIONSHIPS BETWEEN LANGUAGE AND LITERACY

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We really know very little about language and literacy. Both are dangerous territories full of booby traps and quicksand. Language has proved to be more vast than any linguist ever surmised. To define and study language without exhaustion and confusion, we should find language more manageable, but it is not. Bolinger (1975) states: "Each new theory has started with the brave impulse of rectifying the omissions of its predecessors, and then become so absorbed in the rectifications that nothing else seems to matter. Another blind man is describing the elephant. He is as big as creation" (p. 552). If a little knowledge is a dangerous thing, no one is out of danger in discussing language.

If language is a morass of quicksand, literacy is an even more dangerous region. Several of the other presentations here are convincing maps of literacy's menacing geography. In reading for this conference, I encountered numerous diatribes against literacy: it has brought about the rise of nationalism; it supports linear, analytical left-hemisphere domination of the brain to the detriment of intuition; and in sinister ways it supports the ugly tyrannies of the modern industrial state. Most of these articles appear to be written by people who were speaking for the counterculture 15 years ago, and inasmuch as I have my own quarrels with the efficiency-mad industrial and military culture surrounding me, I read their articles thoughtfully. That literacy does render human beings more vulnerable to commercial exploitation and political manipulation impresses me as a danger, but the danger does not convince me that we should abandon the goal. All social life is a dynamic in which any advance creates new problems. In the classic drama _Faust_ there is a bargain. If Faust the scholar achieves absolute perfection and satisfaction, the devil will win the scholar's soul. You who are assembled here today, scholars concerned with literacy, need have no fear of joining the damnation of Faust.

For present purposes I will accept as a basic definition of literacy one by UNESCO: a person is literate when he has acquired the essential knowledge and skills enabling him to engage in all those activities in which literacy is required for effective functioning in his group and community (Sheldon, 1970). However, because this is a vague and flexible definition with implied variation, three further considerations need to be added.

1. At the minimum we should strive to bring all citizens to a level of reading comparable to the average 12-year-old pupil in communities with public schools of reasonably good quality, communities such as Portland, Oregon; Lucerne, Switzerland; Denver, Colorado; and Helsinki, Finland.

2. We must face the fact that most men and women functioning effectively in their communities use writing much less than reading. Writing cannot be justified on any utilitarian base, and inasmuch as successful instruction in writing is a heavy burden for both teachers and learners, we need to reconsider its place in society for those who do not lead lives in professions or activities where writing is necessary.

3. So that changes in lives and in social demands for literacy can still be accommodated after regular schooling, we will need adult education similar to that currently enacted in Sweden. Basically, Swedish law provides all adult workers with the right to take unpaid leave from work for further education and still return to the jobs they held before that leave. If their new skills lead to better jobs, they may take them. Furthermore, facilities to provide such education are a part of the law. (For instance, special funds provide transportation and quality courses in sparsely populated northern Sweden.)

Remember that I have been presenting a minimum of literacy, something a society should aim to achieve even for learners who have great difficulty with schooling. Beyond this minimum I envision the vast majority of citizens, ranging all the way to the awesome heights our greatest statesmen and philosophers achieve. But for all this range, from the minimum to the maximum, there needs to be a purpose for literacy. To me that purpose is freedom from animal struggle for survival, the extra dividend of release from base levels of existence. Human beings need time and occasion for thinking--thinking which leads to reason--and they gain much of this through literacy. Through reasoning that transcends the need to outwit the adverse forces of nature, men and women build their cultures. They can make choices among ethical and aesthetic values; they weigh and consider, sifting truth from falsehood; they can help to organize society on foundations of wisdom rather than on blind authority, false class distinctions, or raw power. In its model of literacy, any theoretical or research approach must include this humanistic component of thinking and reasoning leading to more than survival.

I turn now to insights about literacy to be derived from linguistic theory and research. Any consideration of reading and writing should be founded on a clear understanding of the role language plays in our lives, that it is our way of ordering the chaos surrounding all of us, and that it is a way of making meaningful interaction possible among us. Before they enter school, children have accomplished the miracle of language and they have done so because they needed language to do things they could not otherwise do and because, for survival, they had to put order into existence. Halliday (1973) states: "The impetus for reading and writing is a functional one, just as was the impetus for learning to speak and listen in the first place. We learn to speak because we want to do things that we cannot do otherwise; and we learn to read and write for the same reason" (p. iv).

When we put together all our best thinking, insights, and research about children, the most important wisdom we gain focuses on the way in which they persist in ordering the chaos surrounding every human being. Why do children create symbols? In order to survive, children must not be at the mercy of the incessant, bewildering multiplicity of forces impinging upon them. Like adults, they cannot tolerate the vast buzzing confusion of the external world; they must screen and classify what they need to know and respond to; they must blank out what is trivial, peripheral, irrelevant. So children clarify, surmount, order their emotions and concepts, and their human way of doing this is through symbols.

As children pass into adolescence and reach the stage of Piaget's formal operations, language becomes useful for putting order into social, ethical, and scientific realms. Literacy enables them to receive vicarious experience and knowledge; they can build upon the concepts of others. Literacy provides the permanence and continuity their generation will need in jurisprudence, medicine, engineering, pedagogy, and pure science, to name just a few of the benefits which enable human beings to maintain their slender hold upon the surface of this planet.

What I have just said does not sound particularly revolutionary, does it? Nevertheless, if I expand this theoretical principle a bit further, I believe you will see that adhering to it would revolutionize education for literacy. The development of power and efficiency with any form of language derives from using language for genuine purposes, *not from studying about it*. This sounds so innocuous, so simple, so sensible that I fear you may not realize how utopian it is. If education in all nations were to follow that principle, the changes in education would be awesome. At the present almost all instruction in the mother tongue, the world over, exalts study *about* language. What is a paragraph? Where does one punctuate words in a series? What is a topic sentence? Where do you capitalize? What is a preposition? Give an example of a predicate nominative. In what case is the subject of an infinitive? Where do you use a semicolon? How do you spell *separate*?

Granted, *some* instruction about language is necessary, and at the beginning of reading or writing, instruction about decoding and encoding is crucial. But when knowledge about language becomes an end in itself rather than a means to genuine communication, vast amounts of money and time are wasted and frustration emerges. This studying about language is not how preschool children accomplish the miracle of language, nor is it how adults increase their power over language. The true basics of speaking or writing are sensitivity to an audience one very much wishes to reach and organization of one's thought and language in terms of a purpose suited to that audience. In writing, such editing skills as agreement of subject and predicate, spelling, punctuation, and capitalization are final courtesies to the reader, but they are not central. In reading and listening, we reverse the situation; now it is a demand for meaning, an attitude of interest and awareness of relevance that takes over. Will Beth die as we gather by her bedside in *Little Women*? Will Cowboy Clint and his much-loved horse be reunited now that cruel thieves have separated them in *Smoky, the Cow Horse*? Is this president really going to tell the truth on this TV program we are viewing?

The path to power over language is to use it, to make it work for us. We must not spend too much time practicing Peter-Piper-picked-a-peck-of-pickled-peppers. Nor should young readers spend time in the orange drill box because they scored low on matching subordinate details with main points on a diagnostic test of no interest to them. What is needed in education for literacy, then, is to reverse the present overemphasis upon drills, skills, and knowledge about language, and place at the center the genuine use of language for real purposes.

My intention today is to offer you theoretical and research bases for literacy education rather than application to classroom practices. However, because so many intelligent people fail, on this matter, to see that the emperor has no clothes, I feel impelled to offer a few illustrations of functional language in the classroom. Eleventh graders who have chosen to do so write stories for first graders and try them out with real children, reading them aloud; then they revise and perfect their stories in order to try them out again on a new set of first graders. Both eleventh- and first-grade participants are using language for genuine purposes. Another example: eighth graders write to the third grade, "We hear you have listed fear of the dentist as your primary worry. Well, here is what we have learned about getting over being afraid of the dentist." Third-grade pupils read and discuss these letters with genuine attention. Pupils write for one another, for classes across the hall, across town, in another town, in another nation. They produce humble newspapers; they keep diaries and journals; they read recipes and actually make the ginger cookies; they read each other's stories; they read books suited to their individual interests and find such reading a central part of the curriculum, not an activity belittled as "recreational" or "fun" reading. At the present time too many learners are perfunctorily writing for error-searching teacher-detectives. Many profitable occasions for functional reading and writing should occur in subjects other than English: reporting experiments in science, creating word problems in mathematics, formulating value judgments in family life class--all to be exchanged, read, and shared in group discussion. Teachers in these subjects should view this writing, discussing, and reading in their classes as the pupils' way of clarifying concepts and seeing relationships, for language is one of the best ways to dispel fuzziness and vagueness of understanding.

The problem of converting more of the curriculum to genuine functional reading and writing results not from the incompetence of teachers, but rather from the difficulties of educating such masses of human beings. Busy teachers, young teachers, and teachers working under great difficulties find little time to devise these genuinely functional language situations. To them, textbooks and simplistic multiple-choice tests rise like safe and solid rocks in a turbulent sea. Yet textbooks cannot offer these functional situations, and tests mistakenly called "evaluation of expression" never sample the pupil's own expression or power over oral language. They are likened to the inadequate actor who ran the gamut of emotions from A to B.

Some theories expire with great difficulty. For centuries grammar has been commended as the route to effective speech and writing, but it has never proved to be so. Research has not yet found any grammar system to be an effective avenue to improvement in reading, writing, or speaking. Recently New Zealand decided to take a long, careful, and decisive look at its instruction in grammar (Elley, Barham, Lamb, & Wyllie, 1976). For 3 years, in a number of schools, three carefully matched groups were intensively studied. Groups in the A plan had no grammar but did discuss, write, and engage in both reading instruction and literature. Groups in the B plan had the same curriculum with traditional grammar added. Groups in the C plan had the same curriculum with transformational grammar added. To avoid bias, the teachers were rotated. At the end of 3 years, neither the traditional nor the transformational grammar groups showed any benefits in writing that the non-grammar group did not match. There were no differences in control of sentence structure, mechanics, content, or style. The transformational grammar group did, however, develop an intense distaste for language study.

Two additional studies bear discussion due to their findings concerning the efficiency of grammar study. In the first study seventh-grade pupils were taught transformational grammar and then applied it to practice in combining sentences (Mellon, 1969). This study received notable attention because the pupils improved in syntactic fluency beyond what typical students achieve. However, a subsequent investigation (O'Hare, 1973) carried out the same research but omitted transformational grammar (or grammar of any kind). Seventh-grade students, exposed to grammar-free combining of sentences, ended up writing at a level beyond typical eighth-grade pupils and in many respects equal to twelfth-grade pupils. Inasmuch as none of these studies supports grammar as the route to language power, we can conclude with the Committee on Composition of the National Council of Teachers of English that the study of grammar has a negligible--or because it usually displaces instruction and practice in actual functional composition--even a harmful effect on the improvement of writing. When it usurps valuable classroom time, the study of grammar proves to be a notable instance of flouting the principle that gaining power and effectiveness with language results from using it in genuine communication situations and not by studying about it.

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Other similar research has shown that British pupils who studied traditional grammar in a logically organized program did not write as well as groups who had no grammar, even though the grammar group performed better on a test of grammar (R.J. Harris in Braddock et al., 1963). Because the theory that grammar instruction improves functional verbal skill has not proved true, proponents of grammar have, in recent years, repeatedly shifted their positions. First they claimed that the reason carefully controlled studies of grammar instruction failed to reveal any merit for grammar study was the use of our traditional grammar derived from Latin, a synthetic language in which case endings are important rather than the position of words in a sentence. The imposition of such Latinate grammar on an analytical language like English (which operates on an entirely different system, a system in which word order is important) spawned too many puzzles. Therefore, these defenders of grammar urged the schools to shift, first to structural grammar and then more recently to transformational grammar. However, neither of the new grammars has proved to be sufficiently palatable or helpful to pupils, so the defenders have now retreated to a new position: grammar is valuable for its own sake as a humanistic liberal arts study with intrinsic intellectual appeal. However, inasmuch as the curriculum is crowded, the defenders of grammar will need to specify quite carefully these humane benefits, the contexts in which they should be taught, and especially the pupils for whom the values will operate. The analysis of language will be of interest to some, but for most pupils other areas are more likely to be of greater value in a liberal education.

With most audiences unfamiliar with this research or with linguistic theory, my experience is that many feel affronted or dazed by such a presentation of grammar's negligible contribution to literacy. They even misinterpret such remarks to mean that the speaker is indifferent to teaching standard usage and clear expression. For that reason I feel I must take time to remind you that many people confuse grammar with usage. Grammar, the formal description of the structure of sentences, uses definitions and terminology; it deals with such matters as adverbs and prepositions, with predicate nominatives and infinitives and concord. Grammar deals with the structure of sentences but not with organization or coherence beyond the sentence. Usage refers to the habits of language, the forms all of us use without stopping to think what part of speech or case or declension we are using. Most people, including most teachers, actually mean usage when they say grammar; they are concerned with usage which avoids nonstandard locutions such as *The calf don't want no milk* and *Mary and me done the dishes*. For developing standard usage, the most reliable instructional principle prescribes habit formation through ear training, using models contrasting standard and nonstandard forms (Loban, Ryan, & Squire, 1976, pp. 124-125).

All of us forget that language is completely different from the other academic subjects; it is internal whereas the other subjects are external. Just as *fish gotta swim* and *birds gotta fly*, so *human beings gotta talk*. We come wired for sound; we have this natural propensity to develop language, a propensity as natural as putting our thumbs against the rest of our fingers. The other subjects are external; we do not naturally develop a knowledge of geography or science or algebra. Those subjects we must *learn about*. We must, of course, learn some important things about reading and writing, but because such language abilities are embedded in this internal human propensity, the *major thrust* must be one of using such abilities in genuinely communicative situations. Our volition and emotion need to be involved as well as our most intense cognition. And we should remember that language permeates all these other subjects whereas the other subject disciplines do not permeate instruction in language. Some of the most impressive opportunities for language development occur in well-taught classes of social studies where controversial topics are examined, in family life education where values are weighed, and in shop courses where directions or safety regulations are crucial.

We must now examine a second theoretical principle, that there is no hope of building a successful program in reading or writing on an inadequate base of oral language. The living language is the spoken language, and except for a small number of children who compensate for lack of oral facility by overdoing their writing or reading, the great mass of competent readers and writers are also the superior listeners and speakers. In my own longitudinal language research with 338 subjects, I found that those who were in the highest quartile of reading and writing ability at Grade 6 were the same subjects who were notably powerful in oral language in the primary grades. The reverse was true: those in the primary grades who were relatively mute, inarticulate, and ineffective in oral language were in the lowest quartile of sixth-grade writers and readers (Loban, 1976). In Tucson, Arizona, another researcher has shown that children with superior command of oral language learn to read with a minimum of instruction whereas those lacking oral language effectiveness require intense reading instruction (Cox, 1971).

The neglect of oral language results primarily from a failure to evaluate it. The power to evaluate is the power to control the curriculum, and inevitably the curriculum shrinks to the boundaries of evaluation. Reading and writing have become heavily emphasized to the neglect of the oracy which leads to success in both aspects of literacy. Only in recent times have tape recorders and cassettes made possible the stable evaluation of oral language. Although such evaluation is still time-consuming, small random samples of pupils can now provide evidence of growth in spoken language. Actually the salaries of teacher aides to help in recording and evaluating oral language would not be as expensive as the inadequate commercial tests now used. Research has established that the average number of words per communication unit is an important indicator of maturity in oral language (O'Donnell, 1976). Two other important indicators are vocabulary and the use of meaningful expressive intonation. Both vocabulary and intonation are important indicators of sensitivity to audience, one of the true basics of all linguistic power.

I have asserted that oral language is a necessary base for reading and I have cited research supporting this assertion. However, we should probe into exactly what constitutes the crucial relationship between effectiveness with oral language and success with reading.

In the past teachers assumed that print was read in a sequential manner--either letter by letter or certainly word by word. They assumed that meaning was reconstructed directly from the complete printed forms in which it was encoded. However, evidence indicates that this is not the way typical successful readers actually operate (Goodman, 1973). Quite early in the development of decoding skills, fluent readers abandon word-by-word reading. Instead, their perception of the printed symbols is strongly affected by their innate knowledge of how oral language works. Experimental evidence shows that for fluent readers words are identified in much less time than they would be if they processed them letter by letter or word by word or syllable by syllable. The reader's unconscious oral linguistic expectations enter strongly into the reading process. For example, letters or words are seen which are not actually there, and incorrect elements, actually present, are overlooked and substitutions for them are made according to what the reader would expect to find in such positions. (This very likely accounts for the difficulties of proofreading. We don't see all the mistakes when we proofread. Why?)

Recent studies show perception of expected syntactic patterns to be more important in reading than the strictly sequential relating of print and sound. As an example, Weber (1968) investigated the nature of first graders' oral reading errors and their correction of these errors. The children showed a high degree of sensitivity to syntactical context and would more often correct those errors (in their own oral reading) that violated the syntactical and semantic structure of the sentence than those deliberately cued errors conforming to the structure. Children will often, in context, recognize words they are unable to recognize in a list. Thus the word is not always a critical unit in arriving at meaning. By the time they are 12 years old, typical competent readers use the larger comprehension skills to aid them in recognizing troublesome words. Oral syntactic knowledge is used in the actual process of perception during reading. Speakers of nonstandard dialects will often substitute dialectal forms for standard forms as they read--the dialectal forms being equivalent in meaning. All evidence shows that readers use expectations based on their oral knowledge of language and upon their interiorized grammar.

Research on children's oral reading errors demonstrates that reading is a matter not of sequential processing of word after word but of perceiving the way words cluster in sentences, and that this perceiving is influenced by reader expectation based on oral language and habits of speaking (Clay, 1966). When readers guess at points of uncertainty, their guesses tend to be dominated by these oral syntactic pattern considerations. Thus, misreadings normally occur in equivalent form classes (e.g., nouns for nouns, verbs for verbs). Children pay attention to the actual visual stimulus, but for their final comprehension they are heavily dependent upon their knowledge of oral language and how it operates.

All such research lends support to the idea that mere word-calling, whether developed as a result of looking at the whole word or through examining sequences of letter-sound correspondences, needs to be augmented by closer attention to the oral base for reading. The importance of intonation and stress patterns and of structures such as clauses and sentences needs to be emphasized.

In teaching reading the best strategy is to provide more accurate guessing skills or strategies rather than to insist that children always pay close attention to detail. Too much drill in phonics (after initial decoding learning) encourages children to be distracted by what is relatively minor in fluent reading. It is likely to predispose them to pay attention to details which will eventually result in their being less efficient and fluent as readers. Reading should not be a process of puzzling painfully through a series of obstacles; it is an activity demanding quick, informed apprehension of meaning.

Goodman (1973) has characterized reading as a psychological-linguistic guessing game. His view agrees with the model of reading we have been discussing:

> Reading is a selective process. It involves partial use of available language cues selected on the basis of the reader's oral language expectations. As this partial information is processed, tentative decisions are made to be confirmed, rejected, or refined. More simply stated, reading is a psycholinguistic guessing game. It involves an interaction between thought and language. Efficient reading does not result from precise perception and identification of every element, but from skill in selecting the fewest, most productive elements necessary to produce guesses which are right the first time. (p. 9)

A further support of this theory of reading stems from the structural redundancy characteristic of language. Because of such redundancy, perfect accuracy in decoding is rarely necessary. Children's comprehension increases as the structural redundancy increases in materials they are asked to read (Ruddell, 1965). Teaching materials should be devised for helping children to make efficient use of the redundancy feature of language in narrowing the number of alternatives they have to handle in reading.

The basic theoretical assumption throughout all this research has presented reading as a process to be viewed as part of the larger communication and language problems. Reading is based upon oral language, the living language, and upon a demand for meaning. These larger considerations, high on the scale of the learning hierarchies involved, dominate the lower components.

In this paper I have delved but little into the affective dimensions of literacy, but they, too, are of enormous importance. One of my students (Pietrafesa, 1977) examined the importance of positive attitudes toward reading, justifying the cruciality of positive initial reading experiences, the necessity of continual teacher attention to affirmative attitudes, and the consequent need for a variety of reading materials at varying levels of difficulty. Language cannot be separated from personal, social, and mental development. And literacy cannot be separated from language. Dexterity, flexibility, interest, and confidence --attributes accompanying language proficiency--are deeply linked to personal and social equilibrium.

However, I have taken time to attack a theory of language learning that I will now label the Tinker-toy approach. This false but all-too-prevalent theory assumes a hierarchy of skills wherein a learner starts with the simplest elements and builds to the complex. With Tinkertoys, such a procedure is excellent--and the only way! But in language there is a reverse hierarchy, even more important. Linguistic research shows quite convincingly that whereas language at the higher levels is composed of smaller elements (e.g., roots, prefixes, and suffixes, in turn composed of phonemes), they and their even smaller elements are governed by rules operating at much higher levels of language. Instruction needs to use both directions of the hierarchical scale, and the neglected direction, from high-level meaning to the subordinate components, is of infinite importance to language learning. Polishing the smaller pieces will never substitute for grappling with the dominating total constellations of meaning.

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RESPONSE TO WALTER LOBAN

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In responding to Professor Loban's paper, I will elaborate on some areas that he has touched on briefly, question some of the claims that he has made, and I will point out some important areas for future research. To give you an overview, I will deal with the issue of the role of linguistic theory, in particular transformational grammar, in the research on and teaching of literacy. Secondly, I will talk about the importance of contextualization in language comprehension. I will also touch briefly on the question of the importance of oral language skills in assessing language competencies, and I will point out the need for an investigation of individual differences in language ability as a factor in learning how to read and write.

Let me begin by making some general remarks about two unwarranted assumptions that underlie much theoretical and applied linguistic research. Ever since the "Chomskyan Revolution," language-related disciplines have looked to the transformational linguistic framework with the hope that this model would serve heuristically in investigations of language behavior such as language learning, language comprehension, language production, reading, or writing. It was also thought that transformational grammar might function straightforwardly in a model of language behavior. These expectations have been encouraged by the assumption that transformational grammar is a psychologically real model of speakers' knowledge of their language--that it is a nonmetaphorical description of what speakers know about their language. For example, N. Chomsky (1965) states:

> On the basis of the best information available, it seems reasonable to suppose that a child cannot help constructing a particular sort of transformational grammar to account for the data presented to him. (p. 39)

Unfortunately, some people have accepted this and other similar statements in the literature uncritically. They have overlooked the fact that this is an unsubstantiated claim. It is not an empirically supported hypothesis since

Chomsky has not said what evidence makes such an assumption reasonable. In fact, there is no positive evidence for the psychological reality of transformational grammar. There is also no evidence against the contrary claim, namely that children do not acquire a transformational grammar. This, then, remains an equally reasonable alternative to Chomsky's claim, in particular, since it has not been demonstrated that language can *only* be described by a transformational grammar of the sort that Chomsky has in mind. Thus we have no basis for assuming that a child acquires a transformational grammar rather than another kind of grammar. Transformational grammars, then, are written to describe the *structure* of the *sentences* of a language. They do not describe the *psychological* basis for sentence construction or production by speakers.[1]

I think that it is important to make this point because I have noticed that unwarranted psychological status has been attributed to transformational grammar. Perhaps it has even been a factor that has motivated the adoption of transformational grammar in the school system. For example, Gough (1967) stated at the 1966 NCTE Spring Institutes on the Elementary Language Arts:

> The child somehow develops phrase structure rules and transformational rules. . . . He learns a transformational grammar. (p. 108)

In a textbook dealing with the structure, form, and style of English, Williams (1970) states, somewhat more cautiously:

> How can we--at the age of four--learn language so that we can respond appropriately to grammatical relationships that are completely buried in deep structure? One possible conclusion linguists are exploring along with psychologists and philosophers is that our infant brains are prewired to respond to language that has both a deep

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[1] If transformational grammars describe "knowledge" only in a very metaphorical sense in which no claims are made that the *form* of the rules is what is learned, but only the substance of the rules, then these grammars have no psychological content. See Sheldon (in press) for further discussion of this and related issues.

> and surface structure, prewired to recognize, or at least be prepared to recognize, deep structures beyond surface structures. (p. 157)

Loban (1963, 1976) has used transformational grammar in his analyses of students' oral language. His work also accords psychological reality to transformational grammar, giving it a status that goes beyond its function as a descriptive tool in sentence analysis. For example, in discussing the sentences produced by two of the subjects in his study, Loban (1963) says:

> Dino is not only producing more transformations than Anngelina but also more different kinds of transformations than Anngelina. At the age of ten, Dino is handling grammatical transformation with a proficiency Anngelina has not yet reached even at the age of twelve. (p. 63)

Loban (1976) also reflects this mentalistic conceptualization of transformational grammar:

> To sum up then, we should be interested in the subject's uses of various kinds of deletions as he applies them to items and structures in the sentences he generates. (p. 130)

> Suppose a student has used passive [transformation], then a relative [transformation] and finally Rel + Aux [deletion]. How would the analyst judge and mark this material? (p. 132)

> Of course, in this proposal I know I have not said all that needs to be said about the scheme for analysis and description of the optional transformations students use in casual discourse. (p. 132)

A second assumption that one often finds in the literature, and perhaps a more seriously counterproductive one, is that the 4- or 5-year-old has fully learned his or her language. In his paper in this volume, Loban says:

> Before they come to school, children have accomplished the miracle of language.

In a similar vein, Gough (1967) states:

> The child must be taught many things in school, but before he gets there he has learned something without which he could scarcely be taught at all; he has learned his native language. (p. 92)

This assumption has created a great deal of theoretical bias, such that the study of later language acquisition has only recently gotten under way. But we are beginning to discover that there are aspects of the structure and meaning of one's language that are not acquired until at least as late as 10 years of age (see, for example, C. Chomsky, 1969, and Sheldon, 1977). Hence, we cannot assume that children already have developed full structural and semantic knowledge about their language--or other communicative skills that underlie effective speaking, writing, and reading--before they study these subjects in school. Thus, we would be selling students short by throwing out grammar instruction on the mistaken assumption that they have fully learned their language or that they know grammar in an explicit, conscious way because they speak a language. In fact there is much about the nature and use of their language that children do not know consciously or which they have not even learned yet and which they need to know about in order to read and write.

This brings me to the issue that Professor Loban raises of whether the study of grammar in school will improve reading or writing effectiveness. He observes that various grammar frameworks have had their day in the school system: Latin grammar, structuralist grammar, and now transformational grammar. He concludes that teaching about language does not improve one's use of language in writing. To me this is a startling conclusion. In order to really evaluate it, I first need to have clarified what he means by "teaching about language." He discusses the teaching of transformational grammar as a subject matter in its own right and the use of transformational grammar as a tool to help teach about English. These are two separate issues.

In considering the effectiveness of transformational grammar as a subject matter in its own right, we have to ask the same questions we would ask in evaluating any other subject matter, like mathematics or physics. How well trained in transformational grammar are the teachers? What is their attitude toward it? How does the same group of students perform in other subject areas? To teach transformational grammar as a subject matter is to teach a formal recursive rewriting system, an algorithm for computing the sentences of a language, in which such concepts as "deep structure," "surface structure," and "grammatical rules" are defined. We might expect that to do well in this subject, students should have certain prerequisite quantitative skills and a certain degree of language awareness. I think that the results of any study of the teaching of transformational grammar as a subject in its own right need to be evaluated more carefully and in greater detail along the lines that I have suggested before we can draw any reliable conclusions about the teaching of transformational grammar as a subject matter.

The second sense of "teaching grammar" is to use transformational grammar as a tool to teach about English for the purpose of teaching composition skills. Professor Loban cites Elley et al. (1976)* which putatively demonstrated that no special benefits in writing accrued to students in New Zealand from having studied Latinate grammar or transformational grammar, and that the so-called "non-grammar group did not also match." In addition, this study found that the transformational grammar group actually disliked their language study. He also cites the O'Hare (1973) study as demonstrating that students do not need to know transformational grammar to gain skill in "syntactic fluency." I have a hard time evaluating this claim since the presentation of the O'Hare study is rather vague and the terms are not defined. The subjects in the O'Hare study were putatively "exposed to grammar-free combining of sentences [and they] ended up writing at a level beyond typical eighth-grade pupils." Professor Loban takes this study as evidence in support of the NCTE conclusion that the study of grammar "has a negligible or . . . even harmful effect on the improvement of writing," and he adds that writing effectiveness "results from using language in genuine communication situations and not by studying about it." I do not think that anyone will argue that writing must be functional and not mechanical or boring. But it is hard to understand in what sense grammar is not necessary to the purpose of learning how to write, since grammar is the study of language, which students need to learn how to use effectively. There are a sufficient number of unanswered questions that make me uncomfortable with Professor Loban's conclusion. For example, what is the difference between "grammar-free combining of sentences" and "applying transformational grammar to practice in combining sentences"? Is there, in fact, such a thing as "grammar-free" studying about language? As far as I can tell, what he objects to in the teaching of grammar is the teaching of unnecessary formalism in curricula that contain transformational grammar, or the teaching of terminology and the explicit discussion of rules without imparting a sense for language structure, without developing a sensitivity for how differences in structure can affect the expression of meaning (e.g., in composition). Clearly, I doubt that anyone will argue with this objection. One does not need the formalism of transformational grammar to discover that a sentence is ambiguous, or that two sentences are stylistic variants of one another, one of which works more effectively than the other to give a particular emphasis to a passage. The question is, what is the alternative to teaching composition without explicit grammar instruction? What does the teacher do to teach the necessary skills and in what sense is this not the teaching of grammar?

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*For full references, see pp. 108-109. --Ed.

If what is needed for effective writing is to teach sensitivity to and consciousness of language style and meaning, then there definitely are linguistic insights that can be communicated in order to make students more aware of the different kinds of sentence types in their language and more sensitive to their use in writing. Let me give you some examples of some kinds of skills that I think need to be learned for effective writing (see Williams, 1970): (a) knowing about paraphrase relations, so that students can rephrase sentences in order to emphasize and make clear what is important, (b) becoming aware of how language can be ambiguous, and developing a sensitivity to ambiguity so that the writer can correct it and not mislead readers, (c) learning to detect and correct ungrammatical sentences or sentences whose usage in writing is inappropriate, and (d) learning various stylistic mechanisms, or sentence types, as a means of effectively presenting ideas.

Language acquisition research has not yet determined the extent to which school-age children have even developed any one of these four levels of language awareness (e.g., see Ryan, 1977). Nor do we know how much individual variation there is in these abilities. In addition, it seems that certain types of sentences are learned late, which is probably due to their being literary types of construction, found predominantly in written language. Grammar instruction, then, can expose children to sentence types that they hear very infrequently, if at all, and thus teach them a greater range of written as well as oral expression. Some examples of the kinds of sentence types that appear to be learned late and through written language are the following:

1. Coordinate sentences in which the identical verbs have been deleted.

Dick ordered eggs, Mary a sandwich, and Jane a chocolate doughnut.

2. Sentences with complex subjects (and their paraphrases).

For us to have believed him was a mistake. It was a mistake for us to have believed him.

That I knew you surprised them. It surprised them that I knew you.

3. Sentences with nominalizations (and their paraphrases).

The doctor's careful treatment of him . . . .
His being carefully treated by the doctor . . . .
The careful treatment given him by the doctor . . . .
His careful treatment by the doctor . . . .
The doctor treated him carefully.

Certainly we need more research on late language acquisition in order to know about what children's skills are and how much of their knowledge and awareness about language is due to what they are taught about sentence structure and communicative style in school. One important step in teaching writing is to make students aware of the kinds of sentence types available to them in the language and then to show them what stylistic reasons there might be to choose one type over another (for example, through exercises in which students have to rewrite passages to give them a different emphasis, greater clarity, or a change in meaning).

As far as Professor Loban's suggestion for teaching composition is concerned, I do not really know how to interpret it. He says:

> For developing standard usage, the most reliable instructional principle pre-

> scribes habit formation through ear training, using models contrasting standard

What I find puzzling in this suggestion is that he acknowledges the need to talk about the form of sentences, yet he disavows the need for teaching grammar. But since writing is supposed to be a more careful form of expression than spontaneous speech, and since it cannot rely on the cues to meaning that are present in the natural context of speech, then students need to learn to pay attention to the form and the sequence of sentences in writing. Secondly, I find that talk about the teaching of language usage by "habit formation through ear training" begs the question of just what it is that needs to be taught or learned.

I want to turn to a second area that relates to Professor Loban's presentation, namely, the role of the semantic context of written material. He touches on this in his paper when he mentions the importance of linguistic expectations in the reading process. Transformational grammar has focused on sentences in isolation. However, reading and writing require that people process sentences not in isolation but in relation to each other and to some context. Comprehension research has been exploring the role of contextualization in how people understand and remember reading passages, and I think that literacy research has much to profit from this work. For example, Perfetti and Goldman (1974) studied the effectiveness of words in sentences that were used as retrieval prompts for sentence meaning. They found that words from a sentence were more effective prompts for the recall of that sentence when it appeared at the end of a paragraph than when the sentence was presented in isolation, without a context. They also found that there was no difference in the prompt effectiveness between the subject noun and the object noun when the sentence was presented in isolation. But when the sentence appeared at the end of the paragraph there was a difference; namely, when the subject noun was the theme of the paragraph, it was a much better prompt than the object noun. However, when the object was the theme of the paragraph, both subject and object nouns were equally effective prompts in sentence recall. There are two important findings from this work that are relevant to literacy research. One is that there are discourse processes (in this case, thematization) which make a prompt more effective for sentence recall. That is, our memory for a semantic unit is different if the linguistic material is a sentence in isolation or a sentence in connected discourse, because of the way information is presented in discourse. A second finding is that the grammatical subject of a sentence has no intrinsically favored status in memory due to its syntactic or semantic role in a sentence, since the subject noun was not a better prompt for recalling the sentence when it was presented in isolation. The finding that we process the meaning of a sentence differently when it is in isolation than when it occurs in context underlines the importance of studying the effect of language in context. Teaching about sentence structure alone is not sufficient to teach effective writing. Awareness of the organization of discourse is necessary as well.

The importance of context and of studying spoken language in units that are larger than the sentence is being noted increasingly in studies of early language acquisition (see, for example, Clark, 1974, 1975; Hatch, 1976; and Sheldon, 1977). Studying conversations between learners and their language partners provides important data on how learners use context to get at sentence meaning when the structure of the utterance is beyond their capacity. Clark (1974) remarks:

> It seems then, that in principle a great deal of progress in the comprehension of language can take place without knowledge of syntax. In fact, we might postulate that the child acquires syntax by interpreting the utterances that he hears by reference to the situation, noting the semantic relationship between the words [and] then perceiving the syntactic correlates of that relation. (p. 318)

The importance of context is also discussed in the extremely interesting work of Bransford, Barclay, and Franks (1972), Bransford and Johnson (1972, 1973), and Bransford and McCarrell (1974). Their work points out the importance of what the comprehender must bring to the task of understanding language. Their research indicates that comprehension is affected by the comprehender's ability to use his or her general knowledge of the world to create a context that makes the relations that are specified in the linguistic input understandable. For example, subjects were given prose passages to read. One group was given a picture context before hearing the passage. Another group heard the prose passage first and then saw the picture. A third group saw no picture but heard the prose passage twice. Comprehension and recall of the passage for the group which was given the picture prior to hearing the passage was significantly better than comprehension and recall of the other two groups, which was minimal. Dooling and Lachman (1971) and Bransford and his associates have also found that giving verbal cues (for example, giving the topic of the passage before the presentation of the passage) facilitates comprehension and recall. Notice that since passages were used that involved ordinary activities, such as washing clothes, the difficulty that subjects had in comprehension was due to the situation being described in the passage. The work of Bransford and his associates makes the following observations about the comprehension process, which I think should also be considered in literacy research:

1. The presence of contextual clues significantly reduces the difficulty that people have in comprehending and recalling sentences because they allow them to specify situations in which the sentences could be understood. If, for example, you hear the sentence:

> The haystack was important because the cloth ripped

it is probably impossible to understand it in isolation. But if you are given the word parachute as a cue, you now have information that lets you create a context for that sentence and understand it. Thus, having access to certain knowledge about the world is necessary to meaningfully process the information at all. In fact, subjects in these studies who were not given a context before hearing the passage nevertheless tried to find one that fit the passage.

2. Prior knowledge of a situation is, in itself, no guarantee that a person will be able to understand a passage. Prior knowledge only facilitates comprehension when it becomes activated by a cue that fits with the passage (for example, a picture or a key word).

3. Having knowledge of one's language, including the oral skills that Professor Loban is referring to, is also not sufficient for comprehension because people can fail to understand utterances unless they have set the right scene that will make sense out of what is being talked about. In addition, the same passage can be understood to mean different things when it is viewed from different contexts. The same sentences can be interpreted differently as a function of the different contributions that readers make in the comprehension process.

4. The process of comprehension is a creative one in

which people contribute more information than that which is directly expressed in the input. Comprehenders must be actively involved in finding, either in the passage or outside of it (i.e., in their knowledge of the world or of a particular subject matter), information that helps them construct a context that makes the passage interpretable.

These observations raise many interesting questions for future research. For example, what are children's abilities like in regard to using cues for creating a meaningful context and comprehending linguistic input? Since children are in the process of building up a storehouse of knowledge about the world, their ability to process linguistic input may depend heavily on the number of cues that there are in the input that help them to set the scene for what is being talked about. They may not have learned strategies for creating the context that allows for the input to be interpreted. They may differ from adults in their ability to make inferences. Thus, more information-laden input probably is necessary to facilitate comprehension in children, while adults, who have a great storehouse of knowledge of the world, may be able to comprehend less richly specified linguistic input because they have developed strategies for drawing on their more complete, and perhaps better organized, internal semantic structures. For example, given the sentence

> The haystack was important because
> the cloth ripped,

most adults would probably be able to understand the sentence if they were given the cue parachute. But most children would probably not be able to use that cue to understand the sentence because of limits on their knowledge of parachuting. They would require a more semantically complete input.

Clearly, then, an important component of children's ability to read will be how much they know about the world and how well they gain access to that knowledge (e.g., by making inferences). Successful reading and writing may depend very much on how well the teacher contextualizes the task (for example, by familiarizing the students with the general topic, and creating and clarifying the sense of the passage to be read or written).

It is not surprising that the role that context plays in written language should be so important. Written linguistic material, unlike spontaneous speech, is divorced in time and place from a natural context and from the motives and needs behind the communication. We know that young children have more difficulty repeating a sentence out of context than they have repeating it shortly after it has been spontaneously produced (Slobin & Welsh, 1972). Written language lacks the aids to comprehension provided by face and hand gestures, intonation, the presence of relevant objects, or situational cues. Because these situational supports are lacking, reading and writing probably require that children learn to focus more on the structural properties of sentences than they have to in spontaneous speech. This ability to focus on structure, which is retained for a shorter time in memory than meaning is (Sachs, 1967), probably takes longer to develop and may develop at different rates among children. For all these reasons, children may have to develop new strategies for finding meaning in written material because meaning is not as readily apparent to them. It is reasonable, then, that reading instruction should rely on less arbitrary and more meaningful texts, perhaps the child's own words that have been tape recorded and then written down with the context well noted. The use of cloze tests has also been suggested (Guthrie, 1974). In summary, as Ryan (1977) points out:

> As a deliberate language activity, reading may require a degree of linguistic awareness not necessary for speaking and listening.

If this is true, then, we need to know more about when and how this ability to deliberately and consciously use knowledge of language and of the world develops, what its relation to reading is, and how much individual variation there is in this ability.

I want to turn briefly now to the question of the importance that Professor Loban attaches to oral language skills as a base for reading and writing. There is a danger in relying heavily on children's oral language productions to arrive at a measure of language ability. Research has shown that oral productions underestimate the child's comprehension ability (Fraser, Bellugi, & Brown, 1963). In some cases, the ability to produce certain types of sentences in itself can mislead the investigator in assessing what the child means by the production; hence, it can cause the investigator to overestimate what the child knows about linguistic structure (Sheldon, 1974). Thus, the distinction between competence and performance is a useful one to maintain.

In 1964 N. Chomsky made these same points in his response to early studies of language acquisition that attempted to write grammars for children based on their oral output alone:

> It seems that if anything far reaching and real is to be discovered about the actual grammar of the child, then rather devious kinds of observations of his performance, his abilities and his comprehension in many different kinds of circumstances will have to be brought to bear on the attempt to determine what is in fact his underlying linguistic competence. Direct description of the child's actual output is no more likely to provide an account of the real underlying competence in the case of child language than in the case of adult language, ability to multiply, or any other nontrivial rule governed behavior. (p. 36)

The final topic that I will touch on is the question of individual differences in language ability. Because of the influence of the Chomskyan linguistic framework, which is concerned with the "ideal speaker-hearer," language acquisition research has largely neglected to look for individual differences in child language learning strategies and language competencies. Work is just getting started on this topic and some differences are coming to light (Bloom, 1973; Bowerman, in press; Brown, 1973). In addition, because of the emphasis that has been placed on innate capacities in Chomskyan linguistics, and the de-emphasis on environmental determinism, language acquisition research has largely neglected to look at environmental factors influencing language learning. We are now beginning to look at the nature of language input and the potential training variables that are present in the environment. We do not yet know what the consequences are of a person's language experience and language training on his or her linguistic development. However, the question of individual differences in language capacities surely has an important bearing on the acquisition of reading skills and should be pursued in future research.

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ON TRYING TO SEE THE ELEPHANT: LANGUAGE AND LITERACY

RESPONSE TO WALTER LOBAN

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In his opening remarks in "Relationships between Language and Literacy," Walter Loban describes the linguist looking at language as "another blind man . . . describing the elephant." I like this figure of speech. It describes my own feelings as I have thought about language and literacy over the past 10 years or so. Now, having read Professor Loban's paper, I still think that there are some bushes that keep me from seeing the elephant clearly. So I want to clear away some of the underbrush, to suggest some ways in which our blindness might be further alleviated. To do this, I will comment on three aspects of Professor Loban's paper: the inexactness of the definition of language, the relationship between linguistics and the "functional" view of linguistic theory, and the necessity for keeping clear the distinction between linguistic competence and performance.

In constructing a kind of framework for this discussion, I should note Professor Loban's acceptance of the UNESCO definition of literacy, a definition of the literate person as one who "has acquired . . . essential knowledge and skills." Throughout most of his paper Professor Loban emphasizes the skills aspect of this definition (language use is important to develop); in the last part of his paper, he seems to press the knowledge aspect of the definition, though this is not wholly clear.

Any discussion of the insights about literacy to be gained from linguistic theory and linguistic research must be based upon a consistent, clear, theoretical definition of language. There is not space here to criticize Professor Loban for not presenting us with a theoretical definition. Suffice it to say that statements about language must contain theoretic terms so that varying statements about theory can be minimally isomorphic. In the discussion about children having accomplished the miracle of language there seems to be implied a definition of language as process of acquisition. Language is next defined as a tool *of literacy* in that it becomes useful for "putting order into social . . . realms" and for developing the power to use it. According to Professor Loban, nothing is gained by studying *about* language. He is critical of this knowing *about* language, but in reality, language in this context turns out to be *rhetoric, organization, and spelling*. The discussion blurs here because of a failure, endemic to language arts textbooks since the seventeenth century, to distinguish between the oral and written modes of language.

The paper then moves to embrace the traditional "functional" view of language teaching. Here language is defined as a *skill*. Preschool children "accomplish the miracle of language" by using the skills of language as a means to the power of language. Here language is hinted at not only as a *skill*, but also as *unconscious development*. Further, adults "increase their power over language" by developing "the true basics of speaking or writing"--sensitivity to audience and purpose. The definition of language now points toward the realm of natural language philosophy; it becomes a *performative* definition.

In stating what I believe to be his thesis, Professor Loban tells us that the path to power over language is to use it in genuinely meaningful situations. Language is here apparently rhetoric, or "the path" is rhetoric and language itself remains undefined in any consistent sense. When Professor Loban talks about the need to replace emphasis upon knowledge *about* language with emphasis on "the genuine use of language for real purposes," he is dealing with a dichotomy which is not as clear cut as it seems. It depends upon one's point of view. The dichotomy may exist simply in a way one can look at the language arts curriculum: either you teach "about" language or you teach how to write it. But, in reality, it is the way in which people use language that ultimately determines those things that we must know about it--its phonological, morphological, syntactic, and semantic shapes. It depends on what we mean by "knowing about language"--and this is the final issue I wish to discuss. In the most important sense, we have to "know about" language in order to use it. I suspect that Professor Loban is objecting, as do I, to certain curricula which try to make linguists out of children. For a variety of reasons, these curricula teach about phonemes and morphemes and sentences in a way lacking in consistent, theory-oriented generalization. And children come to school in their earliest years having already utilized remarkable powers of generalization in their language development.

In concluding the first part of my comment on this paper, I will say that I am puzzled by the discussion of the spoken word--"the most important of all language powers." Here language has yet another definition, speech. Yet language is also, in a neighboring context, internal. ("We have this natural propensity to develop language.") The notions speech and internal seem to be the same. At this point in the discussion we need to make a crucial distinction--that between what linguists call linguistic competence (what we know about language) and performance (how we use it). This lack of distinction between competence and skills causes me to lose track of the argument--especially when the living language" is described as the "spoken language."

I wish now to turn very briefly to Professor Loban's argument about the relationship between linguists and a "functional" view of linguistic theory. My comment has little to do with a definition of literacy. I make it only to correct a mistaken notion about a long-dead horse that surely needs no more kicking. The paper states that "some theories expire with great difficulty"--meaning, of course, that linguists keep commending "grammar . . . as the route to effectiveness with speech and writing." The argument continues, stating how linguists over the years have shifted their advocacy from the classroom-traditional grammar to structural grammar to transformational grammar, and now "the defenders have retreated to a new position: grammar is valuable for its own sake." The argument ends with the dangerous utilitarian view that "studying about language will be of interest to some, but for most pupils other areas will be more valuable in a general liberal education."

In countering this view I will only say that a careful examination of recent history will show that linguists have never held the "functional" view toward any grammar. Thus, they have not "retreated" (the context evokes the image of Satan's legions before the wrath of God), and the "position" they hold is not "new" (grammar for its own sake), but can be traced at least to the writings of such people as Otto Jespersen early in this century. Responsible linguists have long recognized the damaging effect to linguistic theory of the demand for any kind of "functional" utility in the classroom. While I will agree with Professor Loban that the study of any grammar has a negligible effect upon writing, I have not ignored research in the last decade into the effects on writing of transformational-grammar-based sentence-combining exercises.

It is the last part of Professor Loban's paper--

that dealing with the relationship between effectiveness with oral language and success with reading--that I find most interesting. Reader perception is affected by "innate knowledge of oral language" and "unconscious linguistic expectations." I remind you of the competence/performance distinction made above, for clearly Professor Loban is referring again to linguistic competence. A grammar of competence may suggest at one and the same time a systematic organization that enables prediction because it *is* systematic. Professor Loban's citation of research by Goodman and Weber suggests to me in the strongest terms possible phrase-structure hierarchy, expectations, internalized grammar, interaction between thought and utterance, and the elemental role of linguistic competence in reading comprehension. Yet the paper seems to ignore this role of competence and the competence/performance distinction--if I understand it correctly--stating that this "perceiving is influenced by reader expectation *based on oral language and habits of speaking*" (unless by oral language Professor Loban means competence, not performance). If we adopt his suggestion that "in teaching reading the best strategy is to provide more accurate guessing skills or strategies," we will be teaching from a competence grammar; we will be teaching *about* language, a practice that Professor Loban has denied as useful in the teaching of writing.

We should accept his notion that reading is a psycholinguistic process and explore it further. But in this exploration we must keep perfectly clear the meaning of *language* as well as the competence/performance distinction, no matter what terms it is couched in. And we must continue to be aware of the damaging effects of the "functional" view upon our attempts to keep these difficult matters in proper perspective.

WRITTEN COMMUNICATION AS FUNCTIONAL LITERACY: A DEVELOPMENTAL COMPARISON OF ORAL AND WRITTEN COMMUNICATION

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A common definition of literacy is the ability to read and write a simple message (cf. Harman, 1970). However, historically there has been relatively little concern with the "message" or communication aspect of literacy in comparison to other aspects, such as learning the connections between sounds and letters. Consideration of literacy as written communication would seem appropriate in light of the recent emphasis on "functional" literacy, or literacy as a practical tool in everyday life (cf. Peck & Kling, 1977). The purpose of this paper is to consider literacy in terms of a developmental comparison of oral and written communication. Since referential communication has been the major concern of studies of communication development in middle and later childhood, the present paper will focus on referential communication. The referential function of communication is to describe or identify objects, events, or ideas, and is often contrasted with other functions of communication, such as the expressive or persuasive functions (cf. Miller & McNeil, 1969).

The similarities and differences between oral and written communication will first be considered. This will include a brief review of nondevelopmental studies contrasting oral and written communication and some of my own research including a developmental comparison of oral and written communication. The results of this research will then be used to review critically some of the major explanations for why communication is different in the oral and written modes. Finally, the oral-written differences will be considered in terms of their implications for literacy.

Similarities between Oral and Written Communication

The basic purpose of referential communication is the same regardless of the channel of communication--that is, to formulate a message that allows the decoder to accurately select or construct the referent of the message. This requires that the encoder take into consideration the information needs of the decoder. The two basic kinds of information needs that must be taken into consideration are the decoder's "individual-related" needs and "task-related" needs (Higgins, 1973, 1977). The individual-related needs derive from the decoder's particular individual characteristics as perceived or inferred by the encoder. These include the decoder's social characteristics (e.g., age, sex, occupation, nationality, social class), physical and intellectual characteristics (e.g., motor skills, linguistic skills, perceptual skills, appearance), personality characteristics (e.g., aggressive, insincere, helpful), and current dispositional state (e.g., angry, tired, daydreaming). For example, an encoder might, under certain circumstances, communicate differently to a friend than to a stranger because the information the encoder has in common with these two decoders is different. The task-related needs of the decoder derive from the particular characteristics of the communication task. These include the properties of the target stimulus or referent, the properties of any alternative stimuli from which the referent is to be distinguished, the type of communicative interaction (e.g., formal versus informal), and the purpose or function of the communication (e.g., depiction versus identification). For example, to describe a route from one location to another so that one's decoder could draw an accurate map of the route is a different task from describing the route so that one's decoder could drive from one location to the other.

It is also necessary for the decoder to consider both task-related and individual-related factors. With respect to task-related factors, for example, the decoder must determine whether his or her task is to draw versus identify the target stimulus on the basis of the message provided. If the task is to identify the target stimulus, the decoder must discriminate and compare the properties of the alternative stimuli and not simply focus on a particular stimulus (e.g., a bluish-green stimulus may be sufficiently blue to match the "blue" message description, but an alternative dark blue stimulus would match the description more closely). This includes considering both the linguistic and extralinguistic context of the message. For example, one would interpret the referent of soda differently when visiting a chemistry laboratory than when attending a party. With respect to individual-related factors, the decoder must consider the particular characteristics of the encoder when interpreting the message. For example, when attending a party one would interpret the referent of soda differently depending on whether the encoder were American (most commonly, a soft drink) or British (most commonly, soda water).

In order to take into consideration the task-related needs of the decoder, an encoder must determine the exact purpose of the communication. For example, in a study reported in Flavell, Botkin, Fry, Wright, and Jarvis (1968) speakers were asked to describe the same display twice--once so a listener could draw it, and then again so a different listener could identify it from an array of alternative displays. Whereas the eleventh-grade speakers provided more information about the display for the listener who had to draw it, the third-grade speakers provided the same amount of information to both listeners. Thus the third graders did not vary their message as a function of the purpose of the communication.

Once the purpose of the communication is determined, other skills are required to fulfill the purpose effectively. Let us consider the case in which the purpose of the communication is to identify or discriminate a target stimulus from a set of alternative stimuli, since most developmental studies of communication have been concerned with this kind of referential communication. The classic experimental paradigm for studying this kind of communication has been to provide the encoder and decoder with identical sets of stimuli and ask the encoder to describe one of the stimuli in his or her set (the target stimulus or referent) so that the decoder can select the corresponding stimulus in his or her set (cf. Glucksberg, Krauss, & Higgins, 1975).

According to a number of models of communication, a major requirement for successful performance on such tasks is the use of comparison processes (cf. Glucksberg & Krauss, 1967; Higgins & Akst, 1975; Rosenberg & Cohen, 1966). Two different kinds of comparison processes have been proposed in the literature. Rosenberg and Cohen (1966) proposed a two-stage stochastic model of the speaker where the second stage involves a verbal comparison process. According to the Rosenberg and Cohen model, the speaker must first sample from a repertoire of associated responses to the referent, where the probability of a word being sampled is considered to be a function of the strength of its association to the referent. The speaker next compares the associative strength of the tentatively selected message to the referent versus to the nonreferent (or alternative stimuli). The greater the difference between these two associative strengths in favor of the referent, the greater is the probability that the speaker will emit the message. The first stage is called the "sampling stage" and the second is called the "comparison stage." If the sample message is rejected in the comparison stage, the speaker will resample from his or her repertoire. This two-stage process continues until the message is considered sufficiently adequate to be emitted.

An alternative, but not mutually exclusive, "feature" comparison process has also been proposed (Higgins, 1973, 1977; Higgins & Akst, 1975). In the study by Higgins and Akst, kindergartners were presented with a stimulus array (Figure 1) where the stimuli were chosen in order that the simple and unique perceptual features of each stimulus would be most apparent and available for communication when all the stimuli were compared together; for example, one

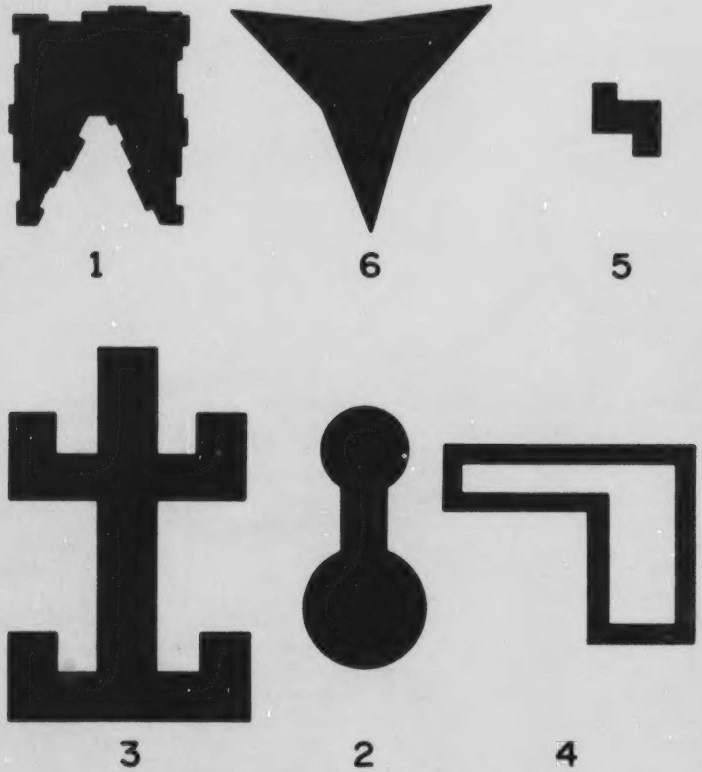

Figure 1. Stimulus array used to test feature comparison processes in kindergartners: Higgins and Akst (1975).

stimulus was clearly the smallest, only one was shaded in, and so on. This stimulus array allowed a preliminary examination of whether a feature comparison stage, in contrast to Rosenberg and Cohen's verbal comparison stage, may occur in referential communication. For instance, if most kindergartners described Stimulus 5 as "the smallest one," it would suggest that feature comparison processes were involved--given that such a description would be unlikely to occur as an associative response to the stimulus in isolation. To further check whether the messages were sampled from a set of associative responses, as suggested by Rosenberg and Cohen, kindergartners' responses in communication conditions were compared to other kindergartners' responses in association conditions. In the communication conditions subjects were told to name or describe each stimulus *so that another child could pick it out from among the other stimuli*. The association conditions were exactly like the communication conditions in that subjects were asked to name or describe each stimulus, but the above underlined instructions were omitted, and subjects were asked to give as many names or descriptions they could think of.

The children in the communication conditions were much more likely to include feature description responses in their messages, such as "the small one" or "the bumpy one," than were children in the association conditions, suggesting their use of feature comparison processes. Furthermore, the feature description responses produced by the children in the communication conditions did not even appear among the responses of the children in the association conditions. Subsequent studies (Higgins, Akst, & Ross, 1977) indicated not only that kindergartners use feature comparison processes, but that most encoders prefer a strategy involving an initial feature comparison stage in which the criterial or discriminating feature of the referent is determined, followed by a "mapping" stage in which the criterial feature is described. Such a strategy does not require a verbal comparison stage.

Both of the above models include a stage in which the referent or particular features of the referent are verbally described (the "sampling" or "mapping" stages). This stage itself requires an extensive vocabulary and knowledge of linguistic rules in order to be effectively carried out. Thus when developmental differences have been found in the adequacy of encoders' referential messages (Asher & Parke, 1975; Glucksberg & Krauss, 1967; Cohen & Klein, 1968), often it has not been clear whether young encoders' difficulties resulted from inadequacies with respect to verbal comparison processes, vocabulary and linguistic knowledge, feature comparison processes, conceptual knowledge, or perceptual discrimination (cf. Longhurst & Turnure, 1971). Nevertheless, the results of a number of recent studies (Dickson, 1974; Ford & Olson, 1975; Harris, Macrae, & Bassett, 1976; Higgins & Akst, 1975; Higgins, Akst, & Ross, 1977) suggest that even 4- to 5-year-olds will modify their message as a function of the alternative stimuli from which the referent is to be distinguished if the referent-nonreferent array contains simple and familiar stimuli. This suggests that even young children will use comparison processes at least under certain circumstances. Similarly, even though there are qualitative developmental differences in how effectively children take into consideration individual-related needs (cf. Flavell et al., 1968; Higgins, 1977), even 4- to 5-year-olds will tailor their messages to suit the individual characteristics and behavior of their decoder when the communication task is sufficiently simple and engaging (cf. Garvey & Hogan, 1973; Maratsos, 1973; Mueller, 1972; Sachs & Devin, 1976; Shatz & Gelman, 1973).

Differences between Oral and Written Communication

Very few studies have directly examined the differences between the oral and written channels in communicative effectiveness. Most studies have been concerned with differences in the linguistic features of the two channels. Studies of linguistic differences between the two channels have reported that sentences encoded in the oral channel generally contain a higher proportion of verbs, adverbs, conjunctions, and first-person pronouns, while sentences encoded in the written channel generally contain a higher proportion of prepositions and adjectives (e.g., Borchers, 1936; Green, 1958; Mann, 1944; Stolz, 1964). In addition, a greater proportion of imperative, interrogative, and exclamatory sentences are used in the oral than the written channel, whereas a greater proportion of declarative sentences are used in the written channel (Borchers, 1936; Devito, 1964). Of more direct relevance to the issue of communicative effectiveness are those studies which report that written messages contain a greater diversity of words and more uncommon words, contain fewer grammatical errors, and are more elaborate and better organized than oral messages, whereas oral messages contain longer sentences and clauses and are more redundant than written messages (Borchers, 1936; Devito, 1964; Green, 1958; Harrell, 1957; Gruner, Kobler, & Gibson, 1967; Horowitz & Berkowitz, 1964; Horowitz & Newman, 1964; Moscovici, 1967; Moscovici & Humbert, 1968; Sunshine & Horowitz, 1968; Portnoy, 1968).

Encoder Effectiveness

Although these differences have implications for oral-written differences in communicative effectiveness, they are not direct measures of communicative effectiveness. As part of a larger study I conducted on communication development (Higgins, 1973, 1977) direct measures of oral-written differences in communication effectiveness were obtained. The subjects in the study were 192 white, native English-speaking boys and girls from middle-class and working-class families attending Grades 4, 5, 6, and 8 in a Catholic parochial elementary school in upper Manhattan, New York City. Three same-sex children from the same grade were tested at a time. The children were brought over to a model town containing toy buildings, vehicles, and people, and the children were told that one of them (the encoder) would be shown a story about something that happened in the town and would then have to tell the other two children (the decoders) exactly what happened. One of the children, the "stranger" decoder, was sent out of the room and the experimenter then provided the encoder and the "neighbor" decoder with information about the people and buildings in the town. This "additional information" was information about the town that was not available from simply looking at the town (e.g., that a particular building was where both the encoder and "neighbor" decoder lived; that a particular person was Mr. Wiley and another person was Dr. Jones). The "additional information" was selected so that an encoder should use it when communicating to the "neighbor" decoder to maximize message economy and effectiveness, but should not use it when communicating to the "stranger" decoder to whom it would be meaningless. The "neighbor" decoder was then sent out of the room, and the experimenter showed the encoder an "accident" story consisting of a sequence of distinct events.

In the actual communication task the encoder and decoder were each given a scrapbook containing an array of pictures on each page where one picture on each page correctly depicted an event in the story and the remaining pictures depicted alternative but similar events (e.g., a picture showing Dr. Jones crossing the street rather than the correct picture showing Mr. Wiley crossing the street). The encoder's task was to describe the correct picture on each page so that the decoder would select it from among the alternatives on the page. The encoder communicated to one decoder at a time, with the order of the decoders alternating across subjects. The encoder and decoder were seated across from each other with an opaque screen between them. No feedback from the decoder was allowed. Half the triads in each grade communicated orally and the messages were tape-recorded and later transcribed. The other half of the triads communicated in writing, with the encoder writing the message on an index card which was handed to the decoder.

The information contained in each message was measured using the information theory formula for bits of information. This formula considers the number of incorrect alternative pictures ruled out by a message in relation to the total number of pictures in the array (Higgins, 1977). When an overall information score was calculated for each encoder by combining the information scores of the messages to both the "neighbor" and "stranger" decoders, a surprising interaction ($p < .05$) was revealed. As shown in Figure 2, whereas the messages of Grade 8 encoders contained slightly more information in the oral channel than in the written channel (approximately 5 percent more), the messages of Grade 4 encoders actually contained substantially more information in the written channel than in the oral channel (approximately 25 percent more). As shown in Figure 3, a similar interaction ($p < .01$) was also found with respect to the amount of useful "additional information" contained in encoders' messages to their "neighbor" decoders. Whereas the messages of Grade 8 encoders contained much more "additional information" in the oral channel than in the written channel (approximately 55 percent more), the messages of Grade 4 encoders contained much more "additional information" in the written channel than in the oral channel (approximately 61 percent more).

Each message was also analyzed in terms of whether each token it contained referred to a property of the target picture that was clearly not a property of at least one of the alternative pictures in the picture-set. (Individual parts of speech, such as nouns, prepositions, and adjectives, were counted as a single token.) If it did, the token was scored as "discriminating" (D). If it did not, the token was scored as "nondiscriminating" (ND). As shown in Figure 4, although the percentage of discriminating tokens (D/D & ND) combined across "neighbor" and "stranger" messages was higher for written messages than for oral messages in every grade, the difference was large and significant in every grade except Grade 8, with this grade x channel interaction being significant ($p < .05$).

Decoder Effectiveness

Given the design of the study, the most direct measure of decoder effectiveness was the ratio of a decoder's observed accuracy to his or her expected accuracy. First, all messages that provided no information to the decoder were eliminated since they did not test a decoder's ability. For the remaining messages, the observed accuracy was simply the total number of correct pictures selected by the decoder, and the expected accuracy was the sum of the

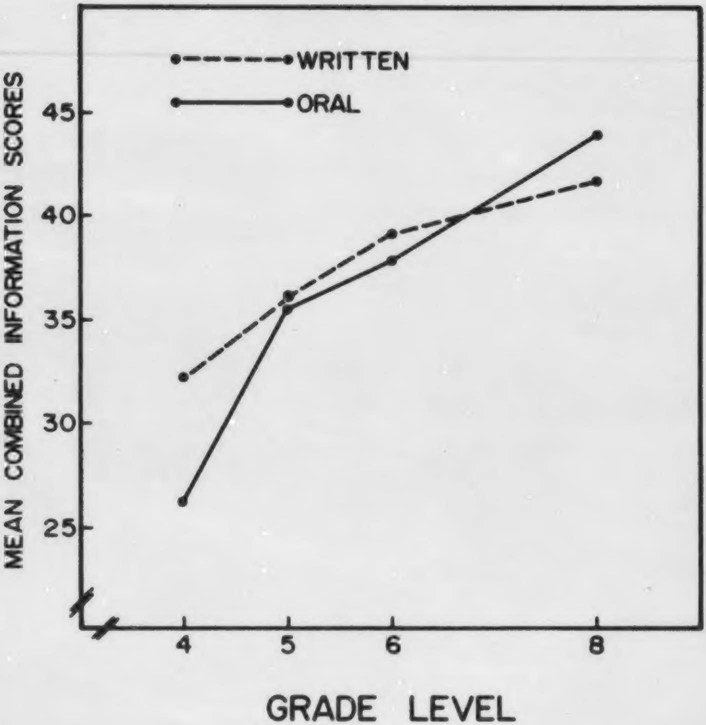

Figure 2. Mean encoder information scores for "neighbor" and "stranger" messages combined as a function of channel and grade level: Higgins (1973, 1977).

chance probabilities across the messages of selecting the correct picture for each message given the number of pictures to which the message referred (which would be 1 for a perfect message and 1/2 for a message that failed to rule out one alternative). For Grades 4, 5, and 6 combined, written messages were more accurately decoded than oral

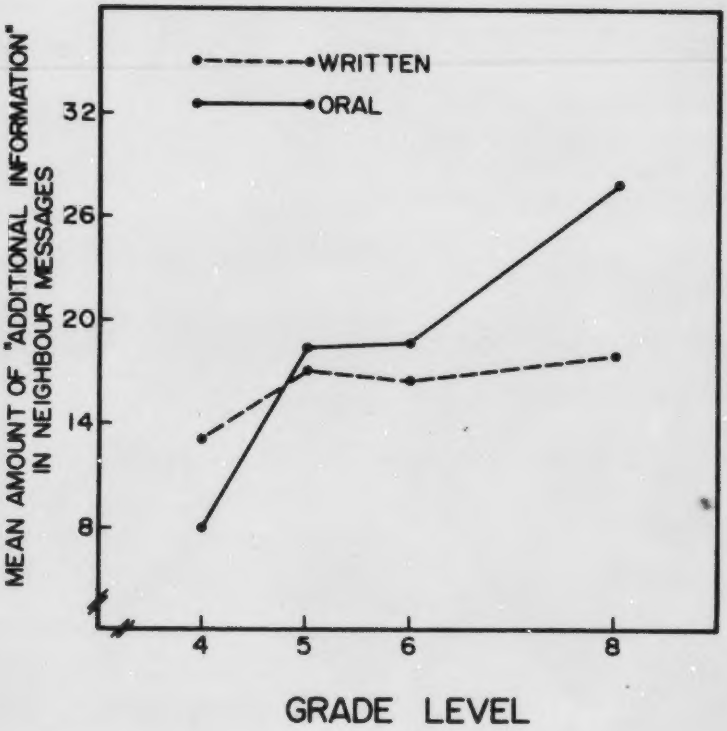

Figure 3. Mean amount of "additional information" contained in messages to "neighbor" decoders as a function of channel and grade level: Higgins (1973, 1977).

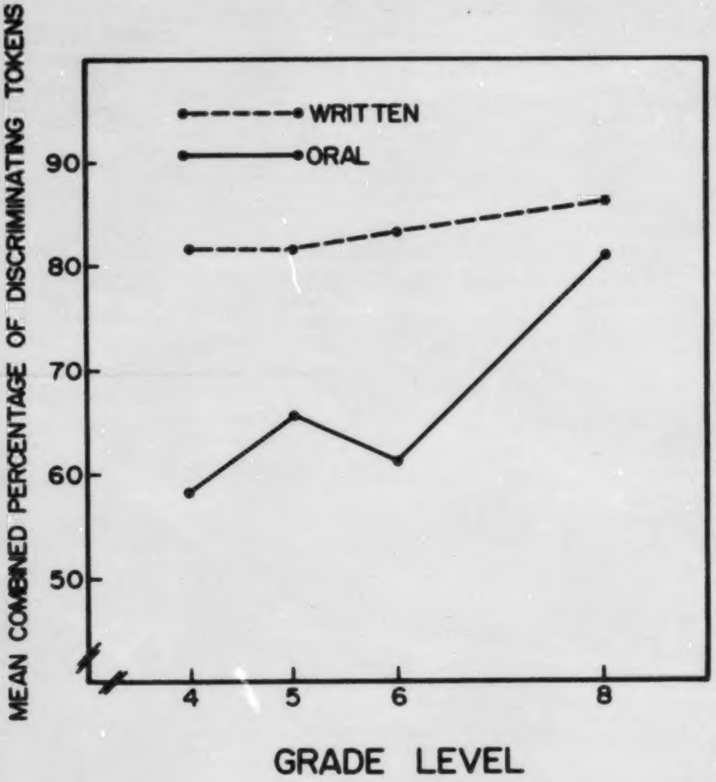

Figure 4. Mean percentage of discriminating tokens for "neighbor" and "stranger" messages combined as a function of channel and grade level: Higgins (1973, 1977).

messages, particularly for "neighbor" decoders ($\underline{p} < .01$) (observed/expected accuracy scores for "neighbor" and "stranger" decoders: written, $\bar{M} = .82$; oral, $\bar{M} = .68$). In Grade 8 there was little difference between written messages and oral messages in how accurately they were decoded, with decoder accuracy being slightly higher for oral messages (written, $\bar{M}$ = .85; oral, $\bar{M}$ = .87). This grade x channel interaction was again significant ($p < .05$).

Dyad Effectiveness

Finally, the oral and written channels were compared on the actual accuracy of the dyadic or two-person communication. For each encoder, the number of correct pictures selected by their "neighbor" and "stranger" decoders was calculated (where the maximum number of correct selections was 20). As shown in Figure 5, dyadic accuracy was higher

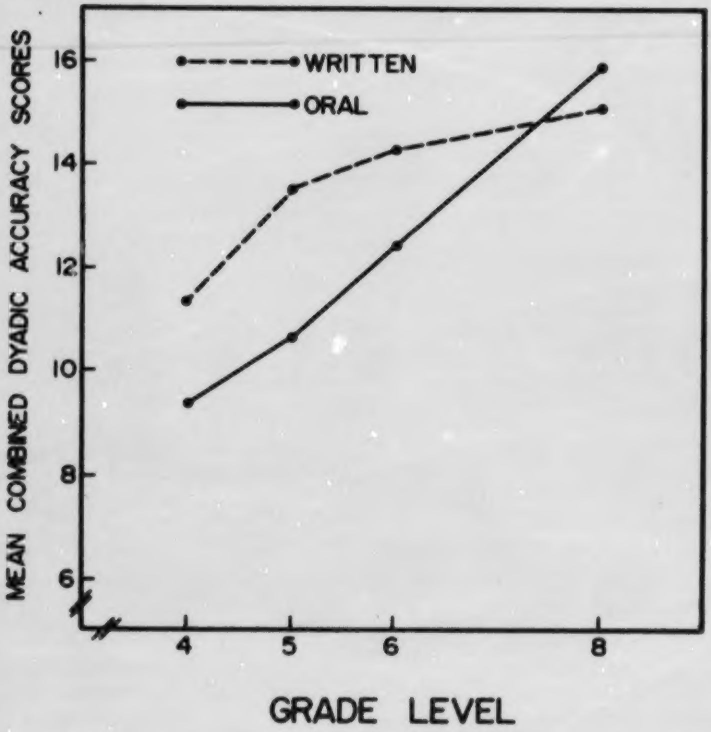

Figure 5. Mean dyadic accuracy scores for "neighbor" and "stranger" dyads combined as a function of channel and grade level: Higgins (1973, 1977).

in the written channel than in the oral channel for Grades 4, 5, and 6, but in Grade 8 dyadic accuracy was slightly higher in the oral channel than in the written channel, with this interaction being significant ($p < .05$).

Redundancy, Efficiency, and Verbal Output

On measures other than communicative effectiveness, the results replicated the findings of previous nondevelopmental studies. In every grade there was greater redundancy in the oral channel than in the written channel. This channel difference was significant in every grade except Grade 4, where there was very little redundancy in either channel. With all four grades combined, 86 percent of the written messages contained no redundant discriminating tokens compared to only 33 percent of the oral messages. The results of this study also replicated previous studies with regard to word production. In every grade there were two or three times as many words produced in the oral channel as in the written channel. Since there was much less difference between the channels in the amount of information contained in each message, in every grade the written channel was much more "efficient" in the sense that there was much more information per word in written than oral messages ($p < .01$).

The oral and written channels also differed with respect to the effect of incentive on verbal output. Encoders in the "high" incentive condition were told that at the end of the task they would receive 25 cents for each correct picture selected by their decoder, and thus they could win $2.50 if their decoder selected all 10 correct pictures. Encoders in the "low" incentive condition were told they would receive 1 cent for each correct picture and thus could win 10 cents if their decoder selected all 10 correct pictures. In the oral channel many more words were produced under high incentive than under low incentive, especially in Grades 6 and 8 (for all grades combined: high incentive, $\bar{M} = 572$ words per message; low incentive, $\bar{M} = 370$ words per message). In direct contrast, in the written channel increased incentive had almost no effect on word production (for all grades combined: high incentive, $\bar{M} = 188$ words per message; low incentive, $\bar{M} = 180$ words per message). Thus whereas there was a 55-percent increase in word production in the oral channel under increased incentive, there was only a 4-percent increase in word production in the written channel under increased incentive.

Interpretations of Differences between Oral and Written Communication

Several different interpretations of the differences between oral and written messages have been proposed. Moscovici (1967) has summarized four traditional interpretations of oral-written differences in encoding.

1. "More complex neuro-muscular processes and greater conscious effort are required for writing than for speaking" (p. 256). Horowitz and Berkowitz (1964) tested the hypothesis that written communication would become more like oral communication as the production of a written message was increasingly facilitated. Specifically, Horowitz and Berkowitz compared speaking to handwriting, typewriting, and stenotyping. Although typewriting and stenotyping were more similar to speech than handwriting on the measures of redundancy and productivity, oral communication was still significantly longer and more redundant than typewriting and stenotyping. Furthermore, the results of our study indicate that oral-written differences in redundancy and productivity were, if anything, greater in Grade 8 than in Grade 4, even though the Grade 8 encoders had greater facility with writing than the Grade 4 encoders. Thus oral-written differences cannot be explained in terms of the greater difficulty of written production. However, as Horowitz and Berkowitz (1964) and Horowitz and Newman (1964) suggest, it may be that the greater effort required to produce a written message may be one reason why written messages are relatively concise and efficient.

2. "Verbal spoken messages presuppose the presence of another person, whereas written messages address an absent person, so that the entire range of gesticulatory and mimetic signs that can be used in speaking are inapplicable to written communication" (p. 256). Vygotsky (1962) emphasizes the importance of the situational context for the production of a message; he characterizes the written message as a "monologue" and the spoken message as a "dialogue." Without precise knowledge of the audience or feedback from the audience, Vygotsky argues, the writer is obliged to use words and syntax more accurately, deliberately, and elaborately. However, in our study both oral and written encoders were visually separated from the decoder with no feedback permitted, and both oral and written encoders had full knowledge of their audience; yet the usual oral-written differences in redundancy, productivity, and efficiency were found. This suggests that although the communicative context may normally be a contributing factor to oral-written differences, it is not a necessary factor.

3. "Each instance of both oral and written communication inheres in a specific social situation that largely determines the emitter's and receiver's behavior. The norms of a particular situation are extended to the speech" (p. 256). This proposal emphasizes the importance of the broader social context in which the communication takes place. Moscovici tested this factor by having subjects communicate in different communication situations--face-to-face, face-to-face with screen between encoder and decoder, side-by-side, and back-to-back. Moscovici found that the spoken messages in the side-by-side and back-to-back situations (the more "formal" situations according to Moscovici) were more similar to the structure of normal written messages than were the face-to-face situations. However, it is apparent that this social situation factor is also not critical for oral-written differences, since oral-written differences were found in our study even though the communication situation was the same for both channels of communication (i.e., face-to-face with screen).

4. "Speaking is a frequent, familiar, quite automatic process and, whereas writing is a rarely exercised mode of expression, it implies conscious, concentrated adaptation to a communication channel that is only occasionally used" (p. 256). One implication of this proposal is reflected in the following statement by Vygotsky (1962) explaining why the development of written communication in the schoolchild falls far behind oral communication: "The discrepancy is caused by the child's proficiency in spontaneous, unconscious activity and his lack of skill in abstract, deliberate activity. . . . The psychological functions on which written speech is based have not even begun to develop in the proper sense when instruction in writing starts" (p. 100). However, whatever cognitive skills schoolchildren may lack, the results of our study clearly indicate that even children who have only recently begun instruction in writing do not lack the ability to write clear, concise, informative messages. In fact, their messages are more informative and efficient in the written channel than in the oral channel. Thus by Grade 4, and perhaps even earlier, most schoolchildren have acquired whatever cognitive skills are required to write effective messages.

With respect to the familiarity or experience aspect of this last proposal, one would expect oral-written differences to be greatest in the earlier grades since the differential experience with the two channels would be greatest for these grades. However, with regard to redundancy, productivity, and efficiency, our study found, if anything, greater oral-written differences in the higher grades. This factor does appear to be consistent with the smaller oral-written differences found in Grade 8 with regard to the percentage of discriminating information and the total amount of information contained in each message, except that the direction of the developmental change was opposite to that suggested in the proposal in that the effectiveness of the written channel relative to the oral channel decreased over time.

It is evident from this review that none of the traditional interpretations summarized by Moscovici (1967) can adequately explain the results of our study. There is, however, another factor that is consistent with the findings. A written encoder can easily review and evaluate his or her message as it progresses by simply re-reading the message, whereas reviewing the message is much more difficult for an oral encoder. As pointed out by Horowitz and Newman (1964), Portnoy (1968), and others, the record of a written message is permanent and easily available, whereas an oral message is easily forgotten. There are, in addition, a number of features of the oral channel that increase the difficulty of reviewing and evaluating one's message. First, much more information is produced per unit of time in the oral channel than in the written channel (cf. Horowitz & Newman, 1964; Vygotsky, 1962). For example, in our study the mean number of bits of information produced per minute across all four grades was 6.5 in the oral channel as compared to only 1.6 in the written channel. Second, there is a tendency in speaking to avoid an "embarrassing silence"; thus oral encoders tend to produce a relatively continuous flow of words. Both of these factors would tend to increase the difficulty of reviewing and evaluating the previous portion of one's spoken message.

One would expect that the easier it is to review and evaluate what one has already covered in one's message, the easier it would be to construct an efficient, concise, and nonredundant message. The fact that the written messages in our study were more efficient and concise and less redundant than the oral messages is consistent with this expectation. One would also expect that facilitating review and evaluation in the written channel would be especially advantageous for younger schoolchildren. The results of our study are also consistent with this expectation, since the youngest schoolchildren produced more effective written messages than oral messages, whereas this was not the case for the older schoolchildren. In fact, in Grade 8 the encoders produced more effective oral messages than written messages. This may be because Grade 8 encoders, being capable of reviewing and evaluating their oral messages, can benefit from the advantages of the oral channel. One such advantage is the greater rate of information production possible in the oral channel, which allows transmission of the necessary information within the natural time constraints of communication, as from fatigue or boredom.

A Test of the "Ease of Review" Interpretation of Oral-Written Differences

Although the results of our study can be explained in terms of the relative ease of reviewing and evaluating one's message in the written channel as compared to the oral channel, the study did not directly test this factor. In a more recent study (Higgins & Barshop, 1977), the effect of this factor on oral and written encoding was directly examined. The study was basically a replication of the previous study but was restricted to Grade 4 encoders communicating to a "neighbor" decoder, since this was the condition in which the relative advantage of the written channel was most evident. The purpose of the study was to compare communicative effectiveness in the oral and written channels when the opportunity to review and evaluate one's message is varied. In the written communication condition, encoders were required to write their messages using a "guide" consisting of a piece of paper that allowed the encoder to write only one line at a time and covered all lines previously written. In the "review" condition encoders reread their message twice using the "guide" and were told to add any information to their message that might help their decoder. In the oral communication condition, encoders' messages were recorded on a dictaphone; in the "review" condition, the tape was replayed twice with the encoders adding any information that might help their decoder. In the "no review" condition, no explicit review or information addition was permitted in either channel. If the ease of reviewing one's message is a critical factor in the oral-written differences for Grade 4 encoders, then their message effectiveness should be greater in the "review" than the "no review" condition. In addition, the oral-written differences should be reduced, if not eliminated.

The subjects were 72 Grade 4 boys and girls from working-class and middle-class families attending a public elementary school in Franklin Township, New Jersey. All subjects were native speakers of standard English. The basic procedure and communication task was exactly the same as in the previous study except that the encoders communicated to an imaginary "neighbor" decoder rather than to a classmate. Both oral and written encoders produced more

Table 1

Mean Information Scores for Oral and Written Messages of Grade 4 Encoders in "Review" and "No Review" Conditions: Higgins and Barshop (1977)

Channel	Review		No Review
	Pre-review	Post-review	
Oral	13.40	14.75	13.21
Written	14.13	15.53	12.98

Note: Maximum possible information score is 24.02

effective messages when they were allowed to review and add to their message. All oral and written encoders in the "review" condition added to their message following their review. For 75 percent of the encoders the additional output included new information about the target picture ($p < .05$). Because of this, the final oral and written messages in the "review" condition contained more information than the oral and written messages in the "no review" condition ($p < .10$). In addition, there was no oral-written difference in either the "review" or "no review" condition. These results suggest that the relative ease of reviewing and improving a written message compared to an oral message is one reason why young encoders are more effective in the written channel.

Concluding Remarks

As previously mentioned, although literacy has been defined as the ability to read and write a simple message, the "message" aspect of literacy has been relatively neglected. Much of the literacy research has focused on the acquisition of the basic ability to read and write, rather than on the use or application of this ability, once acquired, in interpersonal communication. However, many of the factors involved in acquiring the ability to read and write (e.g., the ability to perceptually discriminate or produce written forms) do not underlie oral-written differences in communicative effectiveness once the basic skills are acquired. In addition, even those factors that are important for both acquisition and communicative effectiveness do not necessarily have the same implications for oral-written differences. For example, it has been suggested (cf. Vygotsky, 1962) that a major problem in learning to read and write is the difficulty of remembering which written forms are related to which sounds and meanings. Children would have more difficulty in remembering the relations between words and referents in written than oral language since the relations are first acquired in speech. On the other hand, the results of our studies indicate that children have less difficulty in remembering their description of a referent during written than oral communication since a written message is easier to review. Thus an understanding of the factors involved in acquiring the ability to read and write is not sufficient to understand the factors involved in using the ability to read and write.

It may be useful to consider literacy in terms of the application of reading and writing skills to interpersonal communication. Vygotsky (1962) has stated that schoolchildren have little motivation to learn to write since they have little idea of its usefulness, whereas oral conversation is prompted by various practical motives (e.g., to request something). Under the usual instructional conditions, the motives for writing are intellectualized and removed from the child's immediate needs and context (cf. O'Neil, 1970). In addition, the reading and writing tasks are often removed from both children's past experiences and their basic knowledge about objects and events (cf. Brown, this volume; Shuy, this volume). However, in interpersonal communication tasks the children could read and write about familiar objects and events in a supporting context for the same motive as children speak and listen--for effective interpersonal interaction. As we have seen, under such conditions schoolchildren perform very well in the written channel. Perhaps reading and writing skills should be taught within the context of such practical interpersonal communication both to increase children's motivation to acquire these skills and to increase their recognition of the close relation between written and spoken language.

There are further potential benefits from teaching literacy in the context of interpersonal communication. Recently a number of researchers have suggested that literacy should be assessed by practical, meaningful tasks reflecting job-related skills or educational objectives (cf. Peck & Kling, 1977; Venezky, this volume). A test of effective interpersonal communication would seem to be especially suitable for such assessment of "functional" literacy. In addition, Bormuth (1973-1974) has suggested the need for valid performance tasks for assessing literacy, such as observing whether reading a passage has appropriate effects on the reader's behavior. Interpersonal communication tasks are particularly well suited to obtain such direct measures of appropriate performance.

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RESPONSE TO E. TORY HIGGINS

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Let us begin with the idea of "referring to." Professor Higgins says that "the referential function of communication is to describe or identify objects, events, or ideas, and is often contrasted with other functions of communication, such as the expressive or persuasive functions." He also states that "the basic purpose of referential communication is the same regardless of the channel of communication; that is, to formulate the message in order that the decoder can accurately select or construct the referent of the message."

These statements are clear and helpful; we have no trouble with them. Professor Higgins reduces the basic notion of referring even further in describing certain experiments in which "subjects were told to name or describe each stimulus so that another child could pick it out from among other stimuli."

In referring, one's attention is directed to something and away from something else; if the referring is communicative, then one enables another to direct his or her attention away from other stimuli to the preferred stimulus.

All that I have said seems simple enough and even quite redundant. However, there is here a profound insight. Every act of referring is an act of negating, explicitly or implicitly. But negatives do not exist in nature. What is, is. To say that something "is not" is a human act. You might be saying wearily to yourself, "I wish I were not here." But if you were not here, you would be somewhere, perhaps home in bed. And then you would also not be in London or Hong Kong. Your "not here" indicates your interest, even though that interest may be governed to a large extent by the immediate circumstances.

Why do I bother with all of these words? Because words like Professor Higgins's "the referential function of communication is to describe or identify, or indicate objects, events, or ideas" are often taken to be simply giving back what is given off solely by the objects, events, or ideas, rather than an entering into and participating in, in order to create reality.

Allow me to make the point in another way, and to extend it a little.

Why doesn't the child in the experiment using pictures from the pages of a scrapbook encode such messages as "the one in the upper lefthand corner" and "the second one up on the right"? Such messages strike me as probably being quite efficient. Perhaps because the child has been directed not to do so; in short, doing so would be against the rules of this particular game. But why should the child be concerned about the rules of this game except that disregarding them might result in punishment?* That is reason enough, even if the punishment were nothing more than mild social disapproval. We could multiply the why's and because's to illustrate that a regress occurs that will bring us quickly to assert that some proprieties must be observed on face value or a decent social environment cannot be maintained.

It should be apparent, then, that "referring to" is a human act determined in some part by human motives in particular circumstances. "Description," which Professor Higgins takes to be a sort of referring, is more than responding to the features that something has, even in the simplest circumstances. Moreover, the human act of referring to, like all human acts, is based on some notion of what is proper and what is not. Unless we are to land in an interminable net of why's and because's, some of these notions of propriety will have to remain tacit.

We can accept, then, the distinction among "the referential function of communication. . . and. . . other functions of communication, such as the expressive or persuasive function" with profit if we recognize that doing so is to distinguish among separable but not separate functions and that separating them is fundamentally an act of ignoring, a sort of negation that does not cancel but leaves potential the expressive and persuasive functions in every reference.

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*Professor Higgins informed me at the conference that a design feature in his experiment prevented the hypothetical example from becoming actual. Nonetheless, it seems to me that the example stands--that is, to illustrate the skein of tacit assumptions we make in doing anything. Some of these are social and have to do with our feeling for "the rules of the game." This feature of our lives is an essential part of what we call reality.

I do not read Professor Higgins as disagreeing with these statements. I am simply trying to make explicit assumptions that his essay leaves implicit. Nor do I believe that Professor Higgins is wrong in reducing his concern to the referential function of communication. I am commenting from his essay rather than commenting on it.

These sorts of comments strike me as important in considering the notion of literacy. It is one of those terms that can be taken as bedrock: we must build upon it and we can reach it if we are sensibly motivated and industrious. Put another way, the development of "the ability to read and write a simple message" is one of the basics that we must get back to.

Please notice that statements I have made are imperative: we must. I would argue that even if one were not to make "musts" explicit, the imperative is so bound up in the notion of literacy that it would be apt to function in most communicative contexts in which we shall find ourselves. The concept is too close to the essential assumptions of liberal, democratic-progressive thought. Literacy is an instrument through which one can rise in society, gain economically, and participate in what we are pleased to call self-government.

The persuasive potential of the idea of literacy is so potent that it will likely become functional in what seem to be the coolest of descriptive statements. I do not lament that tendency; quite the opposite. Of course advocacy can be vicious. I am satisfied that it will be most vicious when it is masked as something else.

These days I hear "back to the basics" drop from lips with a high seriousness that amazes me since some of the same persons not long ago were professing distate at former Vice President Agnew's execrable style--its quality made patent by his penchant for alliteration. Of course the movement to the basics and literacy are not necessarily identical, but my prediction is that we shall find them more and more linked as the potencies of the terms and their affinities are sensed by many persons with personal, professional, and financial interests in education.

The most pertinent question at the moment is: what does it mean to be literate in a society such as the one in which we live? Are messages in FORTRAN simple? Does one read the series of images we see on television? Of course I wrote these words before the conference began and by this juncture I predict that the basic question and many of the particular forms into which it can be cast will have been addressed.

Many persons are concerned just now with the state of instruction in reading and writing--and well they should be. I count myself among them. I shall not rehearse the reasons for our concern. But it seems clear to me that the basic problems we face as human communicators are those of making and interpreting messages, regardless of the forms into which those messages are cast and regardless of the channels utilized for their transmission.

I shall not develop my arguments along this line further for want of time and for fear of becoming even less relevant to Professor Higgins's paper. In turning directly to that paper, I would like to highlight several procedures that might be taken to be weaknesses and several interpretations that strike me as definitely strengths in his analysis.

In examining the referential function of communication in the written and oral channels, Professor Higgins chooses to work in the experimental mode. This choice, as with human choices generally, has its advantages and disadvantages. The advantages are gains in control and precision; the disadvantages lie in the necessity of introducing at least a touch of strangeness into the ordinary games of life, for special rules are needed which change the games at least a shade.

Most striking in the experiment reported was the setting in which the communication, both oral and written, took place: "The encoder and decoder were seated across from each other with an opaque screen between them. No feedback from the decoder was allowed" (emphasis added).

It would be difficult to argue that such a setting is normal for children of the ages involved--or for people generally. But it does seem more nearly normal for writing than for speaking. In fact, Professor Higgins cites Vygotsky's characterization of speaking as a dialogue and writing as a monologue. If one takes the difference seriously, one wonders about constructing a situation that reduces the difference so drastically in one direction--that is, making what is normally a dialogue into a monologue. I find Professor Higgins's following comment on the setting perplexing: "In our study both oral and written encoders were visually separated from the decoder with no feedback permitted, and both oral and written encoders had full knowledge of their audience; yet the usual oral-written differences in redundancy, productivity, and efficiency were found. This suggests that although the communicative context may normally be a contributing factor to oral-written differences, it is not a necessary factor."

I am not sure that this statement contains an implicit claim that the strangeness of the situation is not important; if it does, then I would comment that Professor Higgins accounts the force of habit too lightly. Given the requirement to talk and write, the subjects will probably talk and write much as they always do.

Furthermore, a most striking difference was found--that is, in the expected "efficiency" of fourth-grade speakers and writers. An alternative way of stating the difference observed would be to say that the older children, the eighth graders, were less hampered by the abnormality introduced into the circumstances in which they were required to communicate orally than were the younger children, the fourth graders. A follow-up question based on this alternative would be: how do the older children compensate for the deficiencies of the context for oral communication?

In a sense it was this question that was addressed in the follow-up study reported. Although the results of that study seem less conclusive to me than they apparently do to Professor Higgins, the suggestions he indicates do seem promising. However, I must remark that the notion of "review" strikes me as fundamentally one relevant to written communication. One does "review" in a sense when one speaks, but the sense seems to me different and one bound up with feedback. "Review" in the sense that Professor Higgins uses the term becomes more relevant to oral communication the more that communication tends toward the monologue.

What I have suggested is a conceptual difficulty. Let me suggest another.

At the outset Professor Higgins says that "objects, events, or ideas" may be referred to and a little later that the referential task is "to formulate a message that allows the decoder to accurately select or construct the referent." In the experiments reported, the concept of referring is reduced to selecting, not constructing; moreover, objects (and perhaps events) are referred to, not ideas. It would be interesting to compare the efficiency of written and oral channels if constructing ideas were the focus of the referential task.

The limitation of the evidence should be kept in mind in reading Professor Higgins's conclusion that "by Grade 4, and perhaps even earlier, most schoolchildren have acquired whatever cognitive skills are required to write effective messages." Since I find Professor Higgins a careful worker, I am sure that he is well aware of the limitations of his work. Since I find him a resourceful worker, I am sure that he will find ways of extending the scope of his work and of constructing settings that will give his hypotheses appropriate and serious tests.

I have undoubtedly been niggling in worrying about some conceptual and operational weaknesses in Professor Higgins's work. I shall cease such efforts. It will be much easier and more enjoyable for me to celebrate the considerable strengths of that work.

Professor Higgins begins his conclusion by stating that "although literacy has been defined as the ability to read and write a simple message, the 'message' aspect of literacy has been relatively neglected." He is correct. Perhaps it is ironic that in commenting on the concept of referring to and on the embodiment of the concept in the experiments reported, I can be interpreted as chiding him for neglecting in some ways the message aspect of literacy. If so, then he can respond that his effort is a step in the right direction and that, in the face of the neglect mentioned, it is substantial. Again, I agree.

I read Professor Higgins as arguing in effect that an understanding of the factors involved in acquiring the ability to read and write is not sufficient to understand the factors involved in using the ability to read and write. This conclusion strikes me as sound and important. It is important because we so often behave as though the opposite were the case. I would extend the conclusion to communicative activities generally, not just to reading and writing. Some of these will seem so easily, so naturally acquired that we may tend to put them aside as not requiring attention, let alone instruction. If instruction in some of these activities seems like a frill, that may be because we understand very little about using them.

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Throughout his paper Professor Higgins is richly aware of the importance of roles, tasks, and context on communication. His awareness strikes me as especially acute when he reviews the literature pursuant to grounding his own studies. Given this awareness, the concept with which he closes seems especially appropriate--that is, "'functional' literacy." We should be careful, however, that in seeking "direct measures of appropriate performance" we do not reduce too severely the range of functions that we would assess.

DEVELOPMENTAL ASPECTS OF LITERACY:
COMMUNICATION SKILLS AND THE SPECTER OF TELEVISION

RESPONSE TO E. TORY HIGGINS

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Definitions of functional literacy range from the highly circumscribed to the inclusive. One would ordinarily expect social scientists and educators to favor the former because of their concern for rigorous operationalization and the formulation of explicit instructional goals. Consequently, when Professor Higgins treats functional literacy as the array of cognitive skills required for delivering and comprehending messages, he initially seems to be surprisingly nonspecific. However, his work raises some considerations that are common to a variety of reading, writing, listening, and speaking activities and that suggest certain potential efficiencies and economies in thinking about functional literacy. The purpose of this commentary is to explore some of these commonalities and their implications.

The gist of the social science perspective that Professor Higgins represents is that language competence per se is only part of the task of adequate communication. For example, referential communication involves a number of intellectual tasks that may include, but also go well beyond, simple isomorphisms between objects and lexicon words, the dicta of standard usage, and so forth. A literate speaker or writer must not only know how to verbalize a message, but must include in that message elements that are the products of his or her inferences about the states and communicative needs of the listener. Professor Higgins, in this paper and in other writings on the subject (Glucksberg, Krauss, & Higgins, 1975; Higgins, this volume) has given us a sense of the difficulty of specifying how the coordination of these verbal and psychological elements proceeds in mundane communication.

In his paper in this volume, these multiple processing tasks are pointed up by the comparison between oral and written modes. Employing a referential-communication task--one requiring child A to describe or explain something so that person B can accurately identify or select the referent--Professor Higgins discovered that fourth-grade communicators provided more of the necessary information when they wrote their messages than when they spoke spontaneously, whereas eighth graders' messages were similarly informative whether they were writing or speaking. Why should such differences occur? In particular, why do the younger communicators show, in effect, greater functional literacy when they write than when they speak about the same topic?

Professor Higgins attributes the contrast to different cognitive processing demands in the two communication channels. In general, in this (as in many other typical referential tasks) the communicator must constantly compare what has been said with what needs to be said. An effective communicator in such situations continuously measures each utterance against an internal representation of what must be included in the message. Professor Higgins concludes that fourth graders could best engage in this review-and-comparison process when the written record was available as a concrete mnemonic for what had already been said. When they were speaking, they were obliged to rely on their memories for what had been said, thus making the review process entirely--instead of only partly--internal.

At least one source of the difficulty for fourth graders may have been their relatively inefficient memory processes (Hagen, Jongeward, & Kail, 1975). This is all the more plausible given Professor Higgins's findings when he allowed some fourth graders to review their spoken messages via tape recording. Children who had the mechanical record of what they had said performed better than those who did not have the external mnemonic. Apparently, fourth graders' relatively poor oral referential communication in Professor Higgins's task was due to their inability to remember what they had said in a message and, simultaneously, to compare that to some internal representation of what needed to be said. One further piece of evidence (Higgins, personal communication) corroborates this explanation. When children were asked to write their message but were deprived of the written record by being obliged to feed each sentence through a window as it was written, their performance was no better than when they were required to give oral messages. In Flavell's (1974) terminology, the difficulties of these grade-school children in referential communication probably occurred at the point of application of cognitive skills to the communicative task. The children almost certainly knew what needed to be described, and they no doubt also recognized something about the needs of their listeners and the appropriateness of taking them into account. In other words, they probably did not lack competence in the fundamentals of adequate message formulation; the problem arose in the coordination of these separate pieces of information in the course of attempting to communicate.

In Professor Higgins's broader view, functional literacy, then, includes the review of messages in comparison to what further information is needed. The standard against which comparison takes place consists of some internal representation of what must be said--a representation that is, of course, itself the product of a complex and difficult chain of perceptions and inferences about the referent and the other person in the communicative interaction. These aspects of processing have been explored in a number of sources (e.g., Flavell, Botkin, Fry, Wright, & Jarvis, 1968; Glucksberg, Krauss, & Higgins, 1975; Piaget, 1955). Although they have been most often considered in terms of the formulation of messages, these general processing requirements pertain to listening and reading as well as to speaking and writing. The fact that they are common to communicative behaviors of many kinds is one reason for the currency of terms like encoding and decoding that are not specific to a particular channel.

One type of communication experience that is pervasive in the society but is not traditionally thought to have much constructive bearing on the problems of literacy is television viewing. Many commentators on literacy have implicated television in the decline of traditional literacy skills like reading and writing. However, in a broader perspective the comprehension of television content involves many of the processes that Professor Higgins discusses in treating referential communication as functional literacy; that is, television viewing may actually demand skills that are also required for literacy in the more traditional sense. A brief examination of both of these possible effects of this omnipresent communication medium may clarify its relevance to literacy problems.

The former notion--that television affects the incidence of literacy in the society--generally amounts to a "supplanting hypothesis": to wit, that the activity of watching television supplants activities and influences that would foster literacy were the child (or adult) to engage in them. For example, take the highly plausible idea that children are spending more time watching television than did children 15 years ago, with correspondingly less time available for activities like reading. In fact, Lyle and Hoffman (1972) have documented a notable increase in the average amount of viewing among grade-school and high-school students over the decade from 1959 to 1970; during the same time period, average reading time declined slightly for the population of children studied. However, when reading time and viewing time are correlated across individuals, the negative correlations that are predicted by the supplanting hypothesis have, thus far, not materialized (see Feeley, 1973, for a review). In other words, individual by individual, self-reported reading time does not appear to go down as viewing time increases. In fact, for brighter children, reading time and television time are often found to be positively correlated, as are television time and sports, hobbies, and social activities (Lyle & Hoffman, 1972; Schramm, Lyle, & Parker, 1961). This may mean that people today read and do other things while watching television, of course, and the research discussed here does not speak to the possible deleterious effects of this combination of activities on literacy.

The supplanting hypothesis fares no better when the dependent measure is school achievement, more broadly defined. Childers and Ross (1973) examined the television-viewing habits of 100 elementary school pupils in relation to IQ scores, grade-point average, and achievement on standardized tests. The television-viewing indices predicted to none of the indicators of school achievement or mental ability. Although null findings must always be interpreted with caution, there is presently little press toward seeing television as a significant factor in academic performance, including gross measures of literacy skills.

One major caveat is needed, however. These data come primarily from middle-class children and probably do not speak to the circumstances of children from lower socioeconomic strata (SES), who spend more time viewing television on the average than middle-SES children (Lyle, 1972). They doubtless also have fewer opportunities in the home for reading or other intellectual stimulation relevant to traditional achievement indices (Lyle, 1972; Lyle & Hoffman, 1972). These and other important differences among children's experiences with television and other media have not been adequately considered in past research.

The rather striking success story of "Sesame Street"--success story in the sense that there have been measurable effects of the program in terms of explicit instructional goals--is one instance in which television viewing clearly does affect some aspects of the verbal behavior of young viewers, regardless of social class background. At the very least, rote learning of expressions, precocious vocabulary among preschoolers, and awareness of product names and functions are constant tributes to the verbal effects of television (Lyle, 1972). Of course, "Sesame Street" was designed to take advantage of just this aspect of television's influence to teach basic literacy components; in fact, the program succeeded very well in fostering knowledge of letters, numbers, and so forth (Ball & Bogatz, 1972; Cook & Conner, 1976). One study (Minton, 1975) even indicated that "Sesame Street" viewers scored better than nonviewers on the Metropolitan Readiness Test. However, these gains, as the producers of "Sesame Street" intended, are limited to rather superficial aspects of literacy, like knowledge of letters. It is not clear whether and in what ways television might affect some of the more complex aspects--for instance, a reader's interaction with a text or a speaker's interaction with a listener. One obvious possibility, of course, is that children acquire information about facilitative verbal conventions (Shuy, this volume) from watching television programs. Such questions have not been addressed in research.

In order to assess the effects of typical television experience on literacy skills, we need much more refined questions than have been pursued up to now. Realistically, however, even if associations were found among television-viewing indices and measures relevant to literacy skills, it would be very difficult to estimate the proportion of the variance in declining literacy skills that could be attributed to television. The period during which marked increase in viewing time was documented was a period of change and ferment in many other aspects of our national life as well; other forces that affect literacy, like school curricula and values toward education, for example, may well have been changed in character, too. It may be more promising to consider ways in which literacy skills are part of the viewing experience, as well, and exploit those experiences in inducing literacy skills in other modes.

This second approach to the relation between television viewing and literacy skills deals less with effects of television and more with the ways in which responses to television content reflect children's abilities for processing of the sorts of materials that must be decoded by a literate person--stories, conversation, speeches, and television shows alike. In fact, current research on the developing skills of children for comprehending the meaning of audiovisually presented narrative material is parallel to much of the work that is being done with written and orally presented narratives by cognitive psychologists and reading specialists (Bormuth, Manning, Carr, & Pearson, 1970; Kail, Chi, Ingram, & Danner, 1977; Mandler & Johnson, 1977; Rumelhart, 1975; Stein & Glenn, 1975). The focus in all of this work is on the ways in which segmented units--words, sentences, or successive scenes in a film--are integrated so that the narrative is coherent and meaningful. I hope the relation of this to Professor Higgins's discussion of processing in referential communication will become clear as I describe the research.

In our research program at Minnesota's Institute of Child Development, we are concerned primarily with children's comprehension of dramatic programs produced for adults but heavily viewed by children--action-adventure programs, family dramas, and situation comedies. These programs are narratives, or stories made complicated enough to keep adult viewers interested; the plot details are often subtle, inexplicit, and interspersed with extraneous or tangentially relevent material. In order to comprehend the social roles, behaviors, and attitudes portrayed in typical television dramas, children must not only select judiciously among the large number of single happenings or events that are shown, but they must also infer the relations among these discretely presented units of information across time. It is this inferential procedure that seems to me to be a primary part of encoding and decoding written and interpersonal messages generally, and it is instructive to see the extent to which children of different ages accomplish the task in a situation that is a major part of their everyday lives, as television viewing is.

Consequently, many recent studies (Collins, Berndt, & Hess, 1974; Collins, Wellman, Keniston, & Westby, in preparation; Newcomb & Collins, 1977) have concerned the extent to which children of different ages comprehend two types of information from these complex television plots: (a) discrete events that occur in single scenes of the show, particularly those that are essential to the sense of the plot in that without them the story cannot be comprehensibly retold, and (b) implicit information that is not explicitly mentioned or depicted but is implied by the relations between scenes. (An example of the latter is the fact that one discrete event may be recognizable by adults as showing the cause of some second discrete event, but the "because" connector is not explicitly mentioned, as it might well be in an orally presented story.)

These categories of understanding were assessed in a variety of ways, including structured recognition measures and open-ended interview measures of recall and explanation. One example may clarify our goals. In a series of multiple-choice recognition items, we asked both about the explicit central scenes and about the implicit antecedent and consequent circumstances and events that were relevant to those scenes. For example, one question might concern a violent fight ("When the man walked into the office, another man . . . [jumped on him from behind]"). Subsequently, we asked about the cause of the fight ("Someone jumped on the man . . . [because the man knew they had killed an old woman]"). The first question deals with central-scene comprehension, the second with inference. Children get one point for each correct answer in each category.

Comprehension of these televised story materials is both more limited and more fragmentary than adults would expect for children as old as second and third graders. It is limited in the sense that these grade-school children seem to remember a significantly smaller proportion of the essential or central information that is explicitly presented in single scenes than do older children, adolescents, and adults. In one recent study (Collins et al., in preparation), we asked a panel of adult judges to help us identify information that was absolutely central to the plot of a half-hour action-adventure television program; then we asked second, fifth, and eighth graders questions about both the central information and the less essential information. Second graders recalled an average of only 66 percent of the scenes that adults had judged as essential to the plot; fifth graders recalled 84 percent of these scenes; and eighth graders recalled 92 percent--nearly all of them. We found a similar pattern in an earlier study (Collins, 1970) with a situation comedy. One can see how limited, almost random, the younger children's selection from the shows is when one compares memory for essential and incidental information. The proportions of both essential and nonessential, or peripheral, detail increase during most of the early years until, at the junior-high level, children begin to ignore the incidental details while continuing to improve in their attention to important parts of the program. In other words, there seems to be a progressive increase in their ability both to know what is important in the plot and to be able to focus on that important information while ignoring nonessential content. This selective attention to important or essential elements is obviously fundamental to functional literacy, whether in comprehending a television show or describing a circumstance or event to someone else, as Professor Higgins's subjects were required to do.

Even when children understand the content of individual scenes, however, they often fail to grasp the inter-scene relations that also carry important information in audiovisual narratives--hence our conclusion that their understanding of shows is rather fragmentary. Adults readily infer that what happened in a scene early in a program is pertinent to some later scene; for example, they perform as one would expect in noticing the relation between an actor's malevolent intent toward another character in one scene and his violent attack on that character in a later scene. Up until the age of about 9 or 10, however, most children are rather poor at inferring these kinds of causal connections and other links among scenes in typical programs (Collins, Berndt, & Hess, 1974; Collins et al., in preparation). In the latter study, children were tested on their memory for this sort of implicit information. As with our tests of central and peripheral information, a group of adult judges had previously judged the content items in our measure to be important to understanding the plot of the particular program. Second graders comprehend an average of fewer than half (47 percent) of these implicit items that adults had agreed upon, and fifth and eighth graders scored 67 percent and 77 percent, respectively. Interestingly, however, second graders often knew the discrete pieces of information required to answer the questions but had simply failed to infer relationships among them as the other children had. This conclusion is based on computation of the probability that children would make a correct inference of relations between scenes, given that they knew both of the individual scenes on which the inferences were based. Since our recall and recognition measures provided data both on discrete, premise scenes and inferred relations, it was possible to estimate the extent to which children of different ages had inferred the relatedness of discrete pieces of information from the program. The likelihood of correctly integrating important information about the plot across temporally separate discrete scenes is relatively poor for second graders; the probability that they will infer the relatedness of two discrete scenes, given that they know about the two scenes separately, is less than 50 percent--just greater than chance. For fifth and eighth graders, it is considerably better (about 75 percent), indicating that when older children know the discrete, explicit scenes, they are more likely to go beyond them and draw out the implied relationships.

In short, comprehension of narratives presented on television requires that a viewer go beyond explicit but discrete items of information to infer the interrelationships of events and, indeed, the coherence of the plot. In this sense, our data indicate that children as old as second and third graders are less apt to strain for meaning than adults would expect. Their failure to infer relationships among discrete events, in my view, is a major impediment to true functional literacy.

What is the nature of their difficulty? Undoubtedly, their somewhat poorer recall of central details in typical programs impairs their inference-making abilities. Apparently, having relatively little basic information in a task impairs incorporation of additional information (Chi, 1977; Trabasso & Foellinger, in preparation). Younger children are less likely to acquire program specifics and less likely to have a store of general knowledge that would facilitate their remembering the content of narratives and their inferences about them. Nevertheless, when knowledge of specific scenes was taken into account in our analyses, younger children remained relatively unlikely to make literate inferences. Thus, it seems that (a) they fail to recognize--or recognize to a lesser degree than older individuals--the need to infer relations, or (b) they may have difficulty coordinating the need to infer relations and the activity of making the inferences in the ongoing comprehension of the plot.

The evidence gives particular credence to these possibilities. Second graders in our study made inferences but in a relatively low proportion of the instances in which the necessary information was available to them. Psychologists who study children's processing of written and oral discourse (Mandler & Johnson, 1977; Stein & Glenn, 1975) suggest that the difficulty may entail a failure to compare what is known with what ideally needs to be known to make the story complete. Examining children's errors in remembering stories against an ideal story grammar, these investigators have found developmental trends in children's tendencies to fill in gaps in the story as indicated by the implicit ideal scheme. That is, older children more than younger ones tried to fill in gaps in their memory of stories with plausible details, tellingly self-generated to fit a common psychological scheme of story structure (Stein & Glenn, 1975). In the case of recalling television plots, young children may fail to compare what they remember with what needs to be remembered (i.e., with an internal scheme for story information), while the older ones recognize the gaps and spontaneously infer the needed relations.

In short, let me suggest that literate decoding of messages--whether written, spoken, or presented in audiovisual form like television and movies--fundamentally involves a process of continuous, or at least intermittent, review and comparison of information with some internal representation of what needs to be known. Older viewers in our television studies may have been showing a greater facility at this comparison process that was akin to the apparent tendency of Professor Higgins's older subjects in encoding their oral messages. Compared to the fourth graders on the same task, eighth-grade speakers appeared to carry on the simultaneous tasks of reviewing and comparing their previous utterances while formulating additional utterances that provided appropriate additional information.

In reading, of course, this comparison process may often be somewhat easier even for younger children than the analogous process in decoding oral and audiovisual materials. If they are motivated to comprehend the material, they can always go back to fill in gaps in their understanding from the printed text, as Professor Higgins's subjects apparently did in writing messages. By contrast, the sequential format of audiovisual presentations and oral messages requires the decoder to review and compare spontaneously and rather continuously during viewing--a tendency or ability that apparently increases developmentally. The processing of television comprehension, then, may be more similar to processing oral speech than to reading and writing, at least in the sense that the latter involve an immediate record that partly externalizes the comparison process rather than relying on a memorial record, as the former does.

The commonalities between decoding processes for television content and messages in other modes might offer some ways of exploiting, rather than bemoaning, the popularity of television. I am reminded that lower-class youngsters have been found to talk more readily about television programs than about other topics, enabling researchers to obtain a more extensive sample of natural speech from them than they had previously been able to get (Cazden, 1970). Television may offer the sort of motivating circumstances that Professor Higgins suggested for engaging children in communicative tasks in the classroom, so that teachers can pursue some of the goals of functional literacy as we have been describing it.

But more germane to our present point, typical television programming requires viewers to use a range of literacy skills that can be elaborated and reinforced in classroom exercises--skills like selective attention to relevent attributes, role-taking and empathy, impression formation, and temporal integration of information. Watching television content and expatiating upon it can be used to exercise these skills in a way that seems completely pertinent to the development of literacy in traditional terms. For example, children might be induced to engage in the kind of review and comparison that is rather unlikely among younger children but appears important to plot comprehension. Similar review-facilitation strategies have improved children's memory for the content of programs like "Electric Company" (Ball & Bogatz, 1972) and "Misterogers Neighborhood" (Friedrich & Stein, 1975). This approach is not dissimilar to more traditional literacy training and thus could probably be readily combined with, for instance, reading-comprehension exercises in the curriculum. The transfer of training effects from these exercises to writing and reading, speaking and listening, are only speculative at present, but the commonalities in the cognitive-processing aspects of these different activities suggest that benefits may generalize.

Television has typically been assigned a villain's role in the decline of literacy skills. Properly used, however, materials like television programs may actually provide one of our more direct opportunities to increase functional literacy in the television generation.

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Perspectives on Reading

INTRODUCTION

Robert Calfee and Connie Juel, in their paper dealing with reading assessment, address the issues of how theory and research in reading can help to serve educational decision makers. Starting from the point of view that nothing is as practical as a good theory, they offer a model of reading to their liking--the independent process model.

After demonstrating inadequacies in assessment instruments without a solid theoretical base, they posit a set of criteria for evaluating any assessment scheme (what a teacher needs from a test) and an example of an assessment system based upon their independent process model. They cite four criteria that test information should serve. First, the information should point directly to appropriate instructional treatment. Second, it should reveal a student's unique pattern of strengths and weaknesses. Third, it should specify the conditions under which a student succeeds or fails on fairly specific tasks. Fourth, it should provide information in an inexpensive and efficient manner.

Calfee and Juel opt for an interactive reading assessment system. They specify the general as well as some of the specific aspects of such a system. That particular system (one they have been validating at Stanford) fulfills their set of criteria for what is needed in an assessment instrument.

Michael Graves's response to Calfee and Juel's paper emphasizes the importance of two points made by Calfee: obtaining reliable student profiles and beginning the test construction process with a theory that has practical instructional implications. Graves is concerned about one of Calfee's assessment criteria--specifically, is it reasonable to expect tests to yield a student's unique pattern of strengths and weaknesses? Graves questions this point on the grounds that individualization may not be a reasonable expectation in today's classrooms. To his review of specific issues raised by Calfee, Graves adds two of his own perspectives on literacy. First, we need to seriously reconsider the small amount of preparation given to elementary and secondary teachers in their training for teaching students to read. Second, reading teachers and school personnel generally must do a better job of educating university personnel about their specific instructional and diagnostic needs.

Helen Popp, addressing the general issue of using theory and research to inform instructional practice in teaching reading, organizes her paper around three themes: cognitive entry behaviors, affective entry behaviors (motivation), and instructional variables. Popp concentrates on instructional variables, citing research and theory on the reading process as well as the process of learning to read. After examining a wide range of studies, she concludes that we already know a great deal about how to teach reading well and that we ought to put that knowledge to work more systematically and vigorously than we do at present.

Robert Schreiner expands on Popp's theme by reinforcing certain of the variables Popp cites and adding some other factors which he views as potentially powerful in reducing reading illiteracy in this country. He concludes by emphasizing some changes in teacher education that he feels would help children learn to read more efficiently: namely, he believes that we need more teachers who are knowledgeable about language and its relationship to reading, who create an atmosphere with high but humane expectations, and who are well versed in the variety of materials and techniques available for reading instruction.

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HOW THEORY AND RESEARCH ON READING ASSESSMENT CAN SERVE DECISION-MAKING

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The controversy over educational testing continues to make headlines in newspapers and bold type on the covers of professional journals. The actual source of the unhappiness varies somewhat from one complainant to another--based on cultural bias, cost and time, or need. But frequently people express concerns with the inappropriateness of present measures of school achievement. Because of the perceived importance of reading to success in other school subjects, reading tests are challenged with special force. Parents are generally--though not always--mystified by achievement tests but believe that their children's measured performance means something--and it does. Teachers often express the feeling that present reading achievement tests do not measure what is taught--and they are generally right. Administrators hope that their achievement scores will go up rather than down--and about half the time their prayers are answered. (Hopes and prayers are the proper terms, for administrators are hard-pressed to find clear evidence that helps them act to improve reading scores.) Finally, school board members and legislators must feel frustrated that, with so many resources being allocated to the improvement of reading, there is no clear trend toward improvement nationwide that matches the resources--and then they hear experts say that no one knows what the tests measure anyway.

What are the answers to all these problems? First, existing reading tests do serve a useful purpose. As unidimensional indicators, they predict performance on other tests with remarkable accuracy. Second, present tests are extraordinarily inefficient. We could probably cut time and effort to one-fourth or even one-tenth and obtain the same information. Group-administered multiple-choice tests one quarter as long, administered to half the number of students, would provide adequate data for the purposes for which they are suitable, at considerable reduction in cost, time, and effort for everyone. Third, present tests are not appropriate for all the uses to which they are put; they predict general success or failure in school and they call for action, but they do not tell what action to take.

We suspect that a lot of energy presently goes into teaching children what they already know (Durkin, 1974). Given limited resources, this inefficiency is troubling. Tests could provide evidence to highlight areas of need, but to do this requires tests that generate differential profiles--that reveal relative strengths and weaknesses--for student, for class, for school, and for district. Existing standardized achievement tests do not provide reliable profiles. Subtests exist, to be sure, but subscores with quite different labels are highly correlated with one another, and investigators have shown that the profiles are unreliable. Our own work has shown that existing methods of establishing total test reliability are inimical to the creation of tests that yield reliable profile information. Criterion-referenced and behavioral-objective tests have different kinds of problems. Aside from the fact that many look like standardized achievement tests, the teacher and others face a wide array of unorganized data (e.g., school administrators have found it difficult to make use of the findings of the National Assessment of Educational Progress, U.S. General Accounting Office, 1976).

We are convinced that differential profiles exist and that we have the methodology to measure them. In our opinion, advances in differential diagnosis for decision-making are close at hand. These advances will build on two recent developments: adequate theoretical models of the reading process and redefinition of the concept of test reliability.

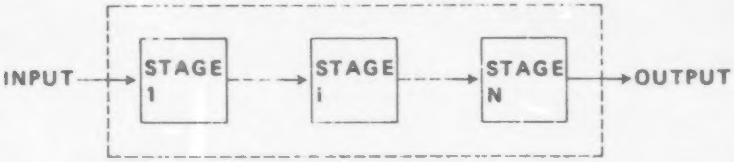
Theoretical Models of Reading

So many diverse theories of reading exist and have proven to be of such little use in solving practical problems that one might wonder why we now turn to the notion of theory. It is said that nothing is so practical as a good theory, and in many areas of applied science this epigram has proven to be true. In principle, an adequate theory of reading should point to appropriate methods of test design and construction and should lead to proper techniques of analysis and interpretation of the results. We believe that such guidance can be found in a theory, though probably not from the complicated models that many have proposed (Calfee, 1975).

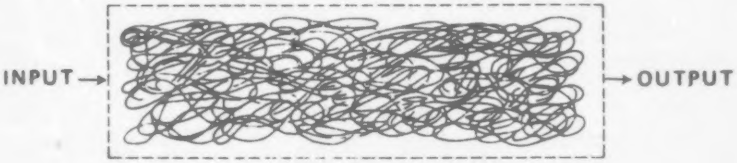
The independent-process theory described below appears unduly simple, but it has powerful consequences (Calfee, 1976). Though it lacks the intricacies of a computer simulation model or the elegance of a mathematical derivation, its consequences are also practical.

Independent-process theory rests on the assumption that the mind carries out certain activities through the operation of independent cognitive processes; by analogy, the mind operates like a "works-in-a-drawer" television rather than through a complex interwoven and interactive network of processes (Figure 1). Psychologists and educators often say that people are complicated--and in some ways they probably are. But for certain purposes, including the design of reading assessment systems, a few simple categories of mental processes may suffice to describe the most important features of performance. This is the essence of the independent-process assumption.

As will become apparent, we also think that the categories of independent processes in reading are closely linked to what is taught. In the case of derived skills like reading, people learn what they are taught, and they learn independently what they are taught independently. Thus, as applied to reading, the theory assumes the existence of separable skills, like decoding, vocabulary, and comprehension. To assess these as independent skills, we



INDEPENDENT STAGES



"GESTALT"

Figure 1. Independent-stage model of thought and contrasting Gestalt model. Sequence of specifiable components operate on information according to independent-stage model, while intricate interactions are postulated in Gestalt model. After Calfee & Floyd (1972).

need clean subtests, which minimize the contribution of ancillary skills. We also need to introduce systematic variation in the content and context of testing, and the critical data include comparisons between performance in one set of circumstances and another.

Example of an Independent-Process Model

We can illustrate how the principle of process-independence applies to the assessment of a student's ability to "read" and understand single words. The task we will consider is a common one at the primary school level. After being shown a list of words selected to represent a particular "level of difficulty," the student is asked first to pronounce each word and then to demonstrate an understanding of a common meaning of the word. What thought processes must the student bring to bear on the task in order to perform successfully? What are possible patterns of failure, and what do these patterns mean for instruction? The information-processing model for test design (Figure 2)

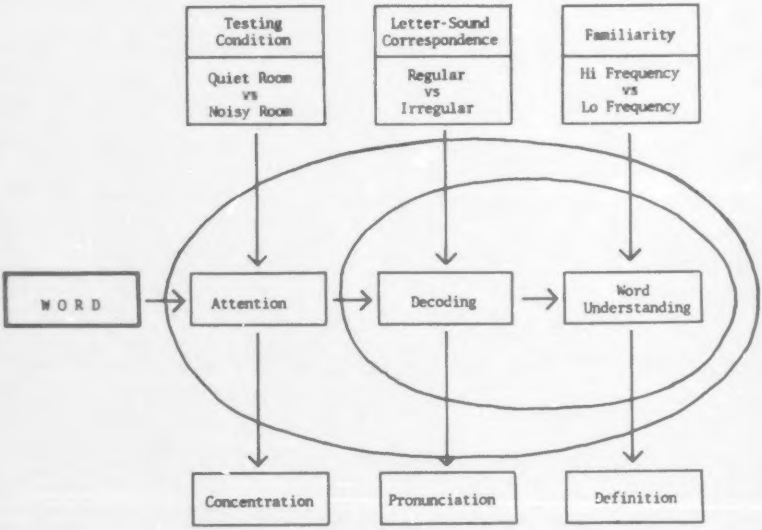

Testing Condition
Quiet Room vs Noisy Room
Letter-Sound Correspondence
Regular vs Irregular
Familiarity
Hi Frequency vs Lo Frequency
WORD
Attention
Decoding
Word Understanding
Concentration
Pronunciation
Definition

Figure 2. Information processing model for word knowledge task.

incorporates three processes: attention, decoding, and lexical interpretation.

The first process, how the student attends to the task, is a complex entity in its own right, including the overall level of activity, the extent to which the student selects relevant cues and rejects irrelevant information, and the degree to which the student can concentrate the maximum available mental capacity on the task (Piontkowski & Calfee, in press). For present purposes we will lump all of these into a single "box." We plan to influence this process by variation of a general character, and we will measure it in generic fashion. We include this process in the model because it seems likely to influence the operation of the other two processes and because specialists in learning disability have identified attentional dysfunction as an important reason for reading failure (Ross, 1976). The design of the assessment system allows us to test this hypothesis for each individual student.

The second process, decoding, handles the translation of print into spoken language. Undoubtedly, there are subprocesses that handle specific aspects of the translation task, but for our purposes we again consider these as an aggregate.

The third process, lexical interpretation, refers to the student's ability to demonstrate a common meaning of a word presented in isolation. One may argue, and rightly so, that during the silent reading of connected prose, the student thinks in a quite different manner than when he is shown a word in isolation and asked what it means. The point is well taken but irrelevant to the present situation. Students are asked to do both tasks as part of learning to read, and the high correlation between performance on the two tasks suggests that they share a number of elements in common.

Once the model is specified, the next step in test design is to designate one or more factors--variations in testing conditions--that are likely to strongly influence the operation of each process. An example of a relevant factor is shown above each of the processes in Figure 2. For instance, in the case of attention, it seems to us that the operation of that process should lead to better overall performance when the student is individually tested in a quiet room than when he is tested with a group in a noisy room. We also propose that regularity of the letter-sound correspondences of the stimulus words should affect the decoding process and that familiarity of the words should influence the lexical interpretation process. Since the design of the test includes all combinations of the factors, each student is tested under all combinations. Thus, in one set of situations the student is taken into a quiet room and asked to pronounce and to define words from combinations of letter-sound regularity and familiarity. The testing is then repeated with different words from the same design in a regular noisy, crowded classroom.

Having specified variations that influence each process, we next want to find a way to measure the operation of each process. We recommend choice of the most direct measures possible. Thus, in addition to recording the correctness of pronunciation and definition, the tester also records the student's concentration on the task as a general measure of attention.

The purpose of the design variations is to measure the student's performance under different conditions as a way of discovering relative strengths and weaknesses. This principle is akin to the clinical tester who, besides noting a person's overall intelligence test score, also considers the difference between the verbal and performance subtests.

Reliability of Profiles

Most tests are designed to optimize the reliability of the total score (Cronbach, 1976). The procedures we are proposing emphasize differences as much or more than overall summary scores (Calfee & Drum, in press).

In general, reliability refers to the degree to which a measurement is consistently reproducible. We can consider the consistency in performance when a person is tested with one form of a test and then retested with a slightly varied form. Several things have changed. The exact form and content of the test have changed. The student has probably changed. He may have learned something, he may have forgotten something, he may have a headache now that he didn't have earlier. All these sources of variability tend to influence the reliability in test-retest situations (Cronbach, Gleser, Nanda, & Rajaratnam, 1972).

Test developers tend to emphasize within-test reliability. There are several ways of thinking about this form of consistency (Cronbach, 1970, Ch. 6). For instance, suppose the test items are divided at random in two parts and the two subscores are correlated. This operation is repeated for all possible split-half divisions of the test;

then the average correlation is computed between the half scores (Cronbach, 1951). This provides a measure of the extent to which each item contributes consistently to the total test score. One way to obtain "perfect" intratest reliability is to use a test in which the items are so homogeneous that the student either fails or passes all items. Test developers, to the degree that they strive for high levels of intratest reliability, are under pressure to eliminate test items that yield divergent patterns of performance from one student to the next. The items that remain seem likely to measure general performance characteristics rather than performances that reflect specific instructional outcomes. So if one wants a perfectly reliable test, one asks the same question 20 times. Either a student knows the answer or he doesn't. This would be absurd, of course, but in the limit it is the ideal toward which reliability aims.

Maximizing intratest reliability is important when the test score is to serve for a major decision, but it may be counterproductive for instructional decision-making. Teachers need to know more than the student's general ability. Individualization requires knowledge of diverse patterns of performance on specific tasks for different students. For the teacher, a "reliable" assessment instrument is more properly defined as one which accurately and consistently indicates the specific patterns of instruction that best fit the student's needs and capabilities.

We have discussed elsewhere detailed techniques for measuring the reliability of profiles and have illustrated the application of these techniques to the design and analysis of reading tests (Calfee & Drum, in press). The technical details are not relevant to our present purposes, but several points deserve emphasis. First, differential information about strengths and weaknesses in separable skill areas is needed for intelligent decision-making. Second, in the design of most current reading tests, "the reliability of the test" is established in a way that optimizes item consistency with the total score. However, to obtain differential profile information requires the development of tests where profile reliabilities are optimized. Third, we suspect that increasing the reliability of patterns will require test developers to minimize generalized task demands and place emphasis on specific task demands in the construction of tests. Such steps should enhance the validity of the tests in significant ways.

Evaluation of the Minnesota Educational Assessment Program

In this section we apply some of the previous ideas in a critical evaluation of the Minnesota Educational Assessment Program (Minnesota Department of Education, 1974). The stated purpose of the Minnesota Assessment is to

> examine the reading performance of Minnesota students, and determine which factors appear to account for a variation in that performance. This report, and analysis of the results, gives a clearer picture of how well students are reading and examines how groups of students vary in performance. By describing the levels of reading performance in Minnesota, the report presents to educators, policy makers, and the lay public reliable information to use in the consideration of alternative directions for educational policy. (p. 1).

The Minnesota Assessment is a generally fine piece of work of this genre. A variety of tasks and content are represented in this group-administered, multiple-choice test. The items are clearly laid out, and the instructions are fairly readable. A detailed analysis of the results was carried out by several independent groups. At times the report has an air of committee writing, but this is inherent in a multiple-perspective approach. We did not have access to specific item analyses; if these are available, they would constitute an important addition to the report.

We will focus our critique on three points: (a) the relation between program goals and the content and analysis of the data, (b) the test layout and item construction characteristics, and (c) the format for presenting measures and reporting data.

In a separate flyer (MSEP--Minnesota Statewide Educational Assessment Program), the following questions are raised:

> How many students in your school district or in the state can read fluently enough to be considered basically literate? How many cannot? How many students read well enough to deal with materials demanding critical, judgmental reading skills?

> How many students read well enough to be successful in a college setting? Are their ambitions in line with their abilities?

These are good questions and sufficiently important to deserve validated answers. Unfortunately, no attempt is made anywhere in this large-scale data collection and analysis effort to validate the results. We will not dwell long on this point--simply stated, it is crucial to obtain other kinds of information on success in schooling as validating criteria for test instruments of this sort. All that we know from this assessment project is how well students do on tests.

A second point about the program goals concerns the way answers are provided. The test items from the Minnesota Assessment are used to generate several indices: basic literacy, school success, reading for critical evaluation and citizenship, and reading for success in college. These indices are reported for aggregated data separately for each index. That is, one can find average performance in basic literacy as a function of various demographic and ethnographic factors. However, nowhere is information provided in a contrastive form so as to show the relative strengths and weaknesses in these areas for various subgroups in the population. The reader can put some of the information together from the report to highlight these strengths and weaknesses, but the report does not do this job. It is not much of a secret to find out that low socioeconomic-status (SES) minority groups do poorly in virtually all of these areas; we also need to know the character of their relative strengths and weaknesses. The report comes close to providing such information in Chapter 4, where "domain" averages are given for several categories of factors. Two samples of data for 9-year-old students are plotted in Figure 3, and it appears that the sharpest group differences show up in the comprehension tasks. However, averages can actually obscure underlying patterns, and what is needed are actual profile statistics for students and schools (Calfee, 1976; Calfee & Drum, in press). (Incidentally, the Minnesota report is skimpy on descriptive statistics, like sample size, measures of variability, and correlations, which could provide a more complete picture of the results.) Nonetheless, the two profiles in Figure 3 suggest an interesting difference between the effects of variation in SES (a relatively sharp contrast in passage comprehension compared with the other differences), and variation in attention (a relatively more constant decrement for the low-attention group in all domains). Information of this sort, sharpened and highlighted, could provide a more useful basis for action than compilations of separate test scores.

The reader may wonder why this is not a problem of reporting. The answer is that it is a conceptual matter and not simply a question of how to present data. Decision-makers at various levels need to begin thinking more about what students can and cannot do in particular instances, rather than focusing on overall levels of skill or weakness. For too many years, the student's "average" performance, weighted to favor verbal and academic skills, has served as a basis for making an overall judgment about that child. It is possible to highlight the child's strengths

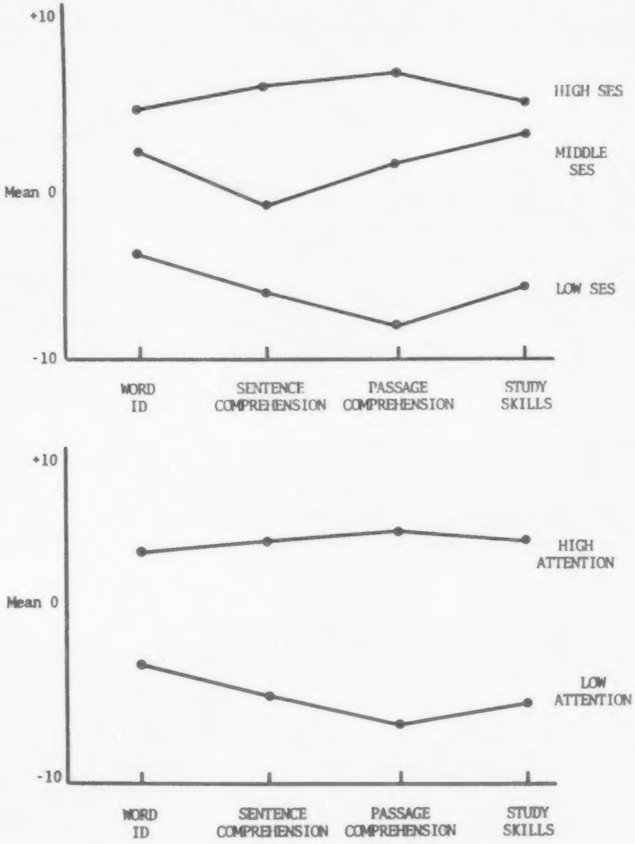


Figure 3. Patterns of group effects in 9-year-olds.

(Cohen, 1973); it may be vital to deal with specific weaknesses. Thinking in this fashion is also likely to lead to tests that are designed for optimally reliable distinctions between significantly different areas of skill and knowledge.

Next, we will look at some of the items in the Minnesota Assessment. Figure 4 shows a set of eight items testing knowledge of prefixes and suffixes. We have several questions. First, why spend so much time testing the concepts of prefix and suffix? Surely, other questions about morphology are equally or more relevant to the child's level of vocabulary competence. Each item takes some time and energy; what other variations in content and task could be substituted to yield additional information about the student's skill and knowledge? For instance, one might ask the student to add affixes that produce changes in meaning, or to show a knowledge of how an added affix changes meaning. Second, what does an error mean? The report includes some efforts to analyze error patterns, to be sure. Nonetheless, the character of the items makes it difficult to know precisely how to interpret an error. For instance, what if the student has not learned these two reading-jargon terms but knows the underlying concept of affixation? He is likely to miss all of the items, leading to the mistaken conclusion that he understands nothing about the concept.

Item content and task demands are important determinants of the concept of testing. If the student believes that the test requires him to look for prefixes and suffixes without regard to meaning, then he does well to check anything that might be a prefix or suffix. For instance, mis and un are both prefixes sometimes, and the student might spot these in Items E and H. Nothing in the testing situation requires the child to check whether such a judgment makes semantic sense. A quick visual scan leads to errors that are promoted by the test design. It is easy to design items that promote errors, but it takes considerably more planning and tryout to find the conditions that promote success.

It is hard to overemphasize the influence of testing context. For instance, the report states: "In the 'ignore the text' strategy, a student seemingly reads the question and chooses a distractor which represents common, but often inaccurate, knowledge" (p. 33). A thoughtful reader of the comprehension questions in the Minnesota Assessment might wonder why a student would follow any other strategy. Many of the questions hinge on external knowledge; more often

In this exercise we want to see how well you can recognize a prefix or a suffix in a word. For each part read the key word and decide whether it has only a prefix only a suffix, both a prefix and a suffix, or neither a prefix nor a suffix. Then fill in the square next to your choice.

Example 1: The word run has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

Example 2: The word react has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

A. The word careless has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

B. The word disagreeable has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

C. The word discolor has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

D. The word impossible has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

E. The word mister has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

F. The word preheat has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

G. The word reddish has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

H. The word union has

☐ only a prefix
☐ only a suffix
☐ both a prefix and a suffix
☐ neither a prefix nor a suffix
☐ I don't know

Note: In the most recent version of the Minnesota Assessment, mister in item E has been changed to miser.--Ed.

Figure 4. Exercise testing prefixes and suffixes.

than not, the student will be correct if he answers on the basis of external knowledge. Reading the prose wastes time and adds little useful information. After enough instances of this sort, the clever (or lazy) student will conclude that he should look first at the questions, and only return to the text when uncertain.

Another exercise from the Minnesota Assessment (Figure 5) is presumably designed to tap vocabulary knowledge.

In this exercise we want to see how well you can use the clues given in a passage to select the best word to complete a sentence. In each part, you are to read the passage and the four choices which follow it. Then decide which word best completes the sentence with the blank space and fill in the square next to your choice.

Example 1: The sun had set and now everything was __________ outside.

☐ light
☐ dark
☐ wet
☐ warmer
☐ I don't know

Example 2: They watched the dog __________ his fleas.

☐ scratch
☐ cat
☐ feed
☐ pet
☐ I don't know

A. The zebra, unlike a horse, is __________ all over.

☐ striped
☐ black
☐ hairy
☐ nervous
☐ I don't know

B. After Billy tore his pants, he carried them to his mother and she __________ them up.

☐ cut
☐ folded
☐ pushed
☐ sewed
☐ I don't know

Figure 5. Exercise designed to tap vocabulary knowledge.

However, the key to these questions is conventionality. For instance, one might believe that zebras are nervous all over, unlike horses. The student who is not familiar with real zebras might also think that they are relatively hairier than horses. The student who has had some experience with zebras (from picture books that stress the striping of this animal) will be at an advantage. Item B is even more dependent on conventionality (and sexism as well). We all know the mother's role includes sewing torn pants. A less conventional mother might decide to fold them up and put them aside--the problem is Billy's, not hers. The thoughtful and creative child might select "I don't know" as the best answer. But conventionality dictates that "I don't know" is never a proper answer on a test.

For each of these items, the critical questions are: What is being tested? What does an error mean? What action should be taken by the decision-maker, teacher, or lay person when confronting a group of students (or individuals) who make mistakes on these items?

We will not follow this line further. However, for any test of this general character, we believe it is a good idea to ask continuously: What does the child have to know in order to succeed? What interpretation is to be put on a failure? How can the test item be modified to gain a wider range of information about the student's capabilities, and to ensure that the skill and knowledge being tapped is measured in as clean, precise, and uncontaminated fashion as possible?

The last point we want to make about the Minnesota Assessment concerns reporting data in a way that make them useful to decision-makers. The Minnesota report contains a great deal of information. Several efforts have been made to simplify the presentation and to reduce the tremendous amount of quantitative information. Decision-makers need descriptive information in the simplest possible form.[1]

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[1] The justification for some of the simplification may be questionable, to be sure. For instance, when one looks at the distribution of scores on the basic literacy index, it is not clear why making 12 correct responses to the 18 questions should be identified as success, whereas making 11 or fewer correct should be failure. There are procedures for validating such decisions (Calfee, 1977), but these were not in force here. Moreover, the several indexes and test batteries in the Minnesota

Our complaint comes from the intrusion of unnecessary jargon and acronyms. For instance, a portion of a table from the report attempts to show the relation between background factors and reading performance (Figure 6). The information is interesting and relevant, but translation into a comprehensible form is a time-consuming task for the expert and probably outside the competence of many of the "educators, policy-makers, and lay public" for whom the report is intended. Our point is simple: researchers who prepare reports should keep the audience in mind.

Perhaps some of our points may seem niggling. However, we are firm in the opinion that researchers and evaluators do have important information to convey to policymakers and the general public. Many are skeptical about the value of educational research and evaluation. This skepticism partly reflects the complexity of the phenomenon. We feel that it also reflects the failure of those who design, administer, analyze, and interpret test results to do their best to provide useful information in a clear manner. For better or worse, those of us who perform this task must be right in everything we do for our work to be of value.

What a Teacher Needs from a Test

In the preceding sections we have looked at characteristics of an assessment system that facilitate decision-making, and have illustrated the points by a situation where decision-making is at a fairly high level. Teachers also make decisions, and, in our opinion, the same principles apply at the level of the classroom as at the higher levels of state administrators and legislators. Partly because the individual classroom situation is more concrete and comprehensible, it may be easier to see the principles in action at that level.

Assessment may, in fact, be measuring a single underlying trait. ("There were 12 measures of a school's reading performance level. Correlation analysis showed these 12 to be highly intercorrelated" [p. 144].) To the degree that the test is unidimensional, the analysis could need a single index rather than the several provided. In fact, we suspect that the correlation is due to the fact that many of the items are not particularly clean and that several of the indexes were constructed to use overlapping items.

Variable	Level	No. Schools Sample 3	Means Y3
SPSESGE3	≤20%	68	59.4
	20-40	106	62.9
	>40	52	66.8
SREDMAT	≤50%	44	66.6
	50-75	129	63.6
	>75	53	57.3
SSCHLIB	≤30%	42	58.4
	30-60	142	63.4
	>60	42	64.6

	School Measures	Average Percent Correct Answers on Reading Test	No. of Schools
Socio-economic status	Percent students in school from high SES homes:		
	less than 20%	59	(68)
	20-40%	63	(106)
	more than 40%	67	(52)
	Percent students in school with limited reading materials in home:		
	less than 50%	67	(44)
	50-75%	64	(129)
	more than 75%	57	(53)
	Percent students using school library at least once a week:		
	less than 30%	58	(42)
	30-60%	63	(142)
	More than 60%	65	(42)

Note: In the original table three samples are presented, but without any clear indication of how they differ. We present the data for Sample 3 only.

Figure 6. Illustration of reporting format from MEAP and easier-to-read format.

What kind of information does the teacher need from a test if the goal is to improve instruction? First, the information is more useful if it points directly to the appropriate instructional treatment. Finding out that the student has not mastered the basic "long-short" vowel correspondences in English gives some direction to the teacher. Being told that the student "lacks adequate word attack skills" is less useful. And information that the student "cannot grasp the abstract character of letter-sound correspondences" may even be counterproductive--the teacher may try to teach this "abstract character."

Second, test information should reveal the student's unique pattern of strengths and weaknesses, not just his overall level of competence. The typical reading achievement test may inform the teacher that the student "reads at the 25th percentile" (i.e., that 75 out of every 100 students in the nation do better than this particular student on the test). Or it may show that the student performs two grade-level-equivalents below expectation for his age. Such messages rarely surprise the competent teacher. If the student is, in general, doing poorly (or well, or average), the teacher does not need a standardized test to discover it. Learning that an old house one has just bought is decrepit and in need of repair is no surprise--hopefully one knew this in the first place. It is more useful to be told that the plumbing is not as bad as it looks, while the apparently solid floor joists are riddled with termites and need immediate attention. Similarly, the teacher is helped by an assessment system that highlights patterns of relative strengths and weaknesses--for example, that a student's understanding of the meaning of certain words is relatively less well developed than his ability to decode them. Such patterns are often undetectable in performance on a generalized test, especially if the student performs poorly overall and the test is not appropriate to his level of competence (Calfee, Drum, & Arnold, in press).

Third, the teacher needs to be able to discover the conditions under which a student succeeds or fails on fairly specific tasks. A low score on a standardized test of reading achievement means the student has not given correct answers to many of the questions on a group-administered, multiple-choice test. To do well on such a test requires numerous skills; if the student fails, the test does not show which skills were lacking. For example, the usual comprehension task requires the student to have "gotten it all together"; it demands proficiency in word-attack skills, vocabulary knowledge, syntax, and ability to group the structural relations in the passage. Two students may both be labeled "poor comprehenders," but for different reasons. The label does not reveal the differences, and the teacher is left without the information needed to improve the situation.

The teacher can most easily determine the student's level of knowledge by asking him to perform the same basic task under a variety of conditions. For instance, perhaps the student who failed on the group-administered comprehension test will succeed when the test is individually administered, with care that the student understands the directions, reads the passage (and the questions and answers), and makes some response to every question. Or perhaps success comes only when the student is asked to read the passage aloud and is given help on words he has trouble pronouncing. What if the student comprehends only when he is helped to understand words that, because of his level of language development, ethnic background, or particular interests and experiences, are unfamiliar to him? The student who comprehends when special care is taken to motivate him for the test does not need more instruction in the subject matter. His poor performance under regular conditions reflects something other than poor reading skill (Goodnow, 1972). Similarly, the student who can demonstrate understanding of a passage when he is helped to decode and define difficult words does not need further instruction on comprehension; he does need more training in decoding and vocabulary.

A fourth requirement for a test, if it is to be useful to the teacher, is that information be cheap and efficient. Administration, scoring, and interpretation must be quick and easy. Otherwise, the teacher is unlikely to use the test even though it gives helpful and relevant information. The problem here is what Cronbach (1970, pp. 602ff) calls the bandwidth-fidelity dilemma. The need is for a test that covers a broad range of skills and knowledge, that provides variation in the task requirements, and that has a "bottom" low enough and a "top" high enough for the variety of students and the extent of learning over the school year. Meeting all these criteria is not simple; however, we believe it is possible to design reading tests that come close to meeting these requirements.

A Practical Example: Interactive Reading Assessment System

Our effort to apply these principles heuristically to improve reading test design, relying on our intuitions about underlying mental processes, is exemplified in the Interactive Reading Assessment System (IRAS) (Calfee &

Calfee, 1977). Concepts of test design will be illustrated by the section of IRAS that measures comprehension skills.

We begin by laying out some of the major dimensions which influence performance on a comprehension task. To be sure, comprehension is a complex activity involving numerous processes. Debate will continue for some time over what the term really means, how exactly to measure it, and what tasks to emphasize under this rubric. For our purposes, the questions have been resolved in a practical manner. The basic comprehension task entails asking a student to read a passage aloud, and then to respond to questions designed to tap his ability to extract specific details of information contained in the passage, to grasp relations among the facts, and to provide a reasonable summary of the main themes. We prefer to have the student read aloud, not because this is essential to comprehension but because it provides direct evidence on the student's level of success in translating the printed text.

The first and most important dimension is the "difficulty" of the passage (whatever this means). If one collects a large sample of materials appropriate to the interests and competence of elementary school children, these can be reliably graded by experts according to the relative ease with which students can read the passages. The features that enter into this dimension are partly known at present--among these are passage length, familiarity of the vocabulary (frequency of occurrence of words in print), syntactic complexity, number of propositions, and degree to which the passage deals with topics that arise in everyday experience. Various readability formulas verify the existence of this dimension and the degree to which one may reliably place a particular passage somewhere on the scale (Gilliland, 1972; Klare, 1974). These details are unimportant to our purposes, which are satisfied by the selection of a wide variety of passages that vary in "difficulty."

A second important dimension for our purposes is the difference commonly referred to as "reading" vs. "listening" comprehension. On the one hand, the tester can ask the student to read the passage himself and then test his understanding, or the tester can read the passage for the student, encouraging him to scan the material as it is read and then test the student's understanding. If the student fails when he reads for himself, he may still do well with similar materials when the tester reads for him. This contrast in performance has important implications for instruction, especially when compared with a third outcome, in which the student does poorly even when the material is read to him.

A third dimension, occasionally mentioned in test manuals but seldom part of either test validation or interpretation, is the character of the question asked. As noted earlier, one may ask the student to recall details of a specific proposition, to put together relations between propositions, or to summarize the structure of the passage. Various other possibilities exist, but these are the main kinds of questions referred to in most discussions of how to measure comprehension (Guszak, 1972). Surely the tester/teacher would want to distinguish between the student whose ability to handle a comprehension task was weak for all categories of questions and the student who regularly got the facts but couldn't organize them.

Another dimension closely related to the type of question is the response required--productive vs. receptive. If the student is asked, after reading a murder mystery, "Who committed the crime?" he must generate the answer on his own, reaching into memory for possible alternatives and choosing the one that seems most plausible. If the student is asked, "Was it the butler or the grandson?" searching memory for viable alternatives is unnecessary. Only recognition is required, and the student may actually use his knowledge of the world to make the choice without reading the material at all. (How often does a writer have someone murder his grandfather? It must have been the butler.)

Figure 7 shows how these dimensions are represented in sample materials from IRAS. For efficiency, the student is asked to help locate his level of competence. He looks at a graded series of passages (those in the figure are from the fifth and ninth levels in a series from 1 to 14), and tells the tester when he has reached a passage that he thinks he cannot read. The tester then asks the student to read the preceding passage aloud and to answer several questions. If the student's reading performance is poor, or if he fails to answer the questions satisfactorily, the tester then asks him to read the next easier passage in the series. This procedure is continued until the student achieves a satisfactory level of performance. If the student is successful on the first passage, he is asked to read the next more difficult passage, and so on until he reaches a level which is too difficult for him.

The interactive procedure described above permits a rapid evaluation of the student's level of competence and the degree to which performance changes with the difficulty of the text. After the reading test is completed, the

Dr. Albert Einstein's neighbor was worried. Every day her small daughter went to call on the great scientist. At last the mother went to Einstein. She told him she was sorry if the girl was keeping him from his work.

"Oh, not at all," Einstein told her. "I like her to come to see me. We get along quite well."

"But what could you and an eight-year-old girl have in common?" asked the mother.

"A great deal," said the scientist. "I love the jelly beans she brings me. And she loves the way I do her arithmetic lesson."

1. How old was the girl in the story?
   6, 8, or 9 years old
2. What two things did the girl bring to Einstein each day?
   Her violin and a letter from her mother; gum drops and her music book; her arithmetic lesson and jelly beans
3. What do you believe Einstein thought about the lessons?
   Were they new, easy, or strange for him?

We talk about a dog being man's best friend, but as often as not it's really the other way around. My Great Dane, Max, for example, seems to think of me as his pet.

To begin with, he is bigger than I am. Max stands seven and a half feet on his hind legs and weighs 280 pounds. There is something about a dog as big as a Shetland pony that keeps you from ordering him around quite as you would, say a poodle. But Max has gotten the idea that he was really meant to be a lap dog. He will come when I am asleep and lie across my legs,which makes it quite impossible for me to move until he wants me to. And if he decides to sleep in a spot where I will stumble over him constantly--well, there is no moving him, of course.

1. How much does Max weigh?
   100, 200, or 300 pounds?
2. In this story Max's owner compares his size to another animal. Name the animal.
   A teddy bear, a poodle, or a Shetland pony?
3. How does the author feel about the saying "a dog is man's best friend"?
   He agrees with it; he thinks the opposite is true; he thinks it isn't true for Max

Note: Portions of passages omitted. After Calfee & Calfee (1977).

Figure 7. Examples of materials from IRAS for testing comprehension of narrative passages.

tester then presents the student with a passage one difficulty level above his limit, and asks the student to follow along as the passage is read to him. Comprehension questions are asked in the usual fashion, and successively more difficult passages are presented until he fails to answer most of the questions correctly. The limits of listening comprehension are thereby established, which measure the contrast between reading and listening comprehension.

Examination of the questions in Figure 7 reveals a structure that includes variation in type of question and productive vs. recognition response demands. Questions 1 and 2 tap specific details; the third question in each series places a different demand on the student: he must answer a question that is not answered by the passage, using knowledge that is assumed by the writer to be part of the reader's experience and that is important for full understanding of the passage. On the one hand, it is reasonable to ask that most comprehension questions should be passage-dependent (i.e., should be based on information contained within the passage). But it is equally true that virtually anything a person reads makes sense only as external knowledge is brought to bear for interpretation (Bower, 1976). In IRAS, a sample of such knowledge is tested explicitly.

On the surface, IRAS resembles informal reading inventories and tests like the Gray Oral Reading Test (Gray, 1967). Indeed, portions of IRAS are modeled after procedures used in the Gray Oral. However, the design of the system permits measurement of contrastive difference scores, which can reflect relative strengths and weaknesses. Moreover, the incorporation of probes and explicit decision strategies serves to formalize the clinical features of the test. The tester is not only able to follow his nose, the test actually points the way. For instance, the tester is able to tell how the student performs when he is given a hint. For the student whose problem is lack of confidence rather than knowledge, it is important for the tester to learn that the student can do very well on a comprehension task when he is prodded, but fails when left on his own. This contrast in performance suggests that his problem has little to do with comprehension per se.

Summation and Recommendations

The theme in what we have proposed above is that a test ought to provide useful information about separable features of the collection of skills known as reading. The level of detail in the breakdown of performance skills should depend on the decision-maker's need for information.

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To be useful, the information needs to have structure and organization. The district superintendent is not helped by being presented with the average percentage of correct responses for each of 394 behavioral objectives for each school in the district. For that matter, neither is the teacher likely to be helped by knowing the same information about each student in the class. To be told that competence in decoding and vocabulary skills is relatively higher than competence in literal comprehension skills provides a more reasonable basis for action.

This theme may not seem to suggest much change from present procedures. After all, most standardized achievement tests provide a breakdown into subtests. However, there are two differences between what is suggested in this paper and existing practices. First, present tests, shackled by the restrictions to group administration and multiple-choice format, do not provide adequate coverage of all the relevant areas of competence (for instance, we currently know little about what students know about decoding because such information requires that the student read words or text aloud). Second, we have emphasized the influence of the testing context on performance and the related matter of measuring corollary aspects of performance. If a student succeeds in performing a task under one condition but fails under another, then basic knowledge is assured; it is the student's ability to apply that knowledge that is in question. Some students do poorly on a group test because of distraction and lack of motivation. Tested individually, with care to assure that they understand what is required and with the attention and interest of another human being to motivate them, the same students may do quite well. From the point of view of someone who has to decide what action to take to help the student improve his performance, this information would seem quite important. Even in a closely monitored individual testing situation, the way a student behaves may be an important piece of information. The student who is obviously concentrating, who tries alternatives when he suspects he is wrong, whose posture and wrinkled brow show dedication to the task--and who still fails to perform well--requires different treatment from the student who fails and who also exhibits obvious lack of attention, hyperactive movement, or disinterest.

Since there is only a modest amount of research directly based on the ideas in this paper, recommendations for action should be received with caution. However, based on our knowledge and experience in reading research, we feel relatively confident in presenting three concrete recommendations that depart substantially from present practices:

1. Do less massive, "broad-band" testing, but improve the quality (reliability and informativeness) of what testing is done (Venezky, 1974). Don't do away with all testing, for that weakens accountability.

2. Look to instruction as the model for what to test, and then consider the influence of the testing situation, the tester, and the materials. For the teacher, the best question is often, "Are there any conditions under which the student can succeed at this task?" Reading teachers teach several different things, and what is taught will vary from one level to another. Assessment systems should be designed to reflect these differences, and the emphasis should be on the reliability of the patterns of these differences.

3. Information must be organized if it is to be useful. Too often, educational decision-makers have the option of too little information (a single test score) or too much information (a myriad of behavioral objective scores). Theory provides a useful tool for organizing knowledge. In reading, we know enough about the phenomenon to build models of the process that are of practical value in creating tests and interpreting test data.

These recommendations build on the assumption that, if viewed properly, the acquisition of reading follows a small number of fairly simple themes and that assessment reflecting these themes in a straightforward fashion can serve directly for decision-making. Research on reading abounds. Much of it portrays reading as a complex of interactive skills, idiosyncratic to the individual student-teacher-school combination. Such a description may be partly true; it certainly lends itself well to the creation of intricate flow charts and complex computer programs. But we think that reading is perhaps not so intricate after all. Teaching a child to read is sometimes a demanding task, but many teachers succeed at this task year after year. Success in this endeavor is certainly more common than success in teaching a computer to read.

The presumption of complexity goes against the canon of parsimony, but more troubling, it leaves us unable to take action; experience is a poor guide when every situation is unique. The concept of independent processes is simple, practical, and readily serves as a basis for action. Research is paying off. There have been some false leads and progress has seemed slow at times. But we believe that the next 10 years will see a significant breakthrough in the assessment of reading; we are seeing some useful results already (e.g., McDonald & Elias, 1975). We are not about to solve all of our problems; curriculum development and teacher training will not be immediately influenced by improved assessment techniques. But the availability of a richer information base from the differential assessment of reading skills will leave decision-makers at all levels in a better position to find out where they need to take action.

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RESPONSE TO ROBERT CALFEE AND CONNIE JUEL

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Like many of the papers presented at this conference, Professor Calfee's paper is sane, balanced, and thoughtful. Although I would not have written the same paper, there is little in it with which I directly disagree. What I am going to do, therefore, is first briefly mention two of Professor Calfee's points that I would particularly emphasize and one that I have some qualms about; I will then use several of his points to advance two of my own perspectives on literacy.

The first point that I want to emphasize concerns reliability. All I can do here is echo Professor Calfee. Most current tests do not yield reliable profiles of subskills, and current practices used to achieve reliable total test scores mitigate against creating reliable subtests. We obviously need reliable subtests if we are to plan instruction appropriately.

The second point I would emphasize concerns the theory behind the test suggested. In taking as his starting point the assumption of independent processing--"that the mind carries out certain activities through the operation of independent cognitive processes"--and developing from that assumption an information-processing model that emphasizes attention, decoding, and word understanding skills as separable processes involved in "a student's ability to 'read' and understand single words," Professor Calfee is definitely beginning from a theoretical perspective that can have practical instructional implications. A logical instructional procedure to use with a child who understands a large number of words but can read only those he has been explicitly taught is to teach decoding skills. The theory behind Professor Calfee's test leads directly to focused instruction such as this.

The notion of focused instruction for each child leads to a third point Professor Calfee considers. This is the one I have some qualms about. These have to do with the practical feasibility of individualization. In talking about what a teacher needs to know, Professor Calfee states that a test should reveal a "student's unique pattern of strengths and weaknesses." My question is that of how much detail the teacher needs and can reasonably be expected to use. I repeatedly hear the assertion that individualization is one of the most important goals toward which teachers should work. In another paper presented here, Professor Popp notes that her own research has indicated the value of diagnostic prescriptive practices followed by individualized instruction and cites results obtained by Samuels and Edwall (1976) as also supporting individualized instruction. However, the findings of Samuels and Edwall also support the value of structure, and the major review of research recently completed by Rosenshine (1977) again indicates the value of structure. In keeping with the latter findings, my own work in tutoring (Graves, 1976; Graves & Patberg, 1976) and the work of Ellson (1976), Ellson, Harris, and Barber (1968), Rosenbaum (1973), and Von Harrison (1972) indicate the value of highly structured programs that permit individualization almost solely in terms of the rate at which students move through the material.

In light of these findings regarding the value of structure, I am seriously concerned about how much structure, sequence, and order the teacher can provide while creating individualized programs. In fact, while it is undeniably true that there are a number of classrooms in which instruction is not geared to the varying needs of the students--classrooms in which individualization is vitally needed--there are a number of others in which the attempt to individualize results in chaos, with each student doing something different but few if any following a structure sequence that makes sense.

I will now attempt to draw two of my own perspectives on literacy from several of Professor Calfee's points. In his comments on theory, Professor Calfee both recognizes the very limited effect that theories of reading have had in solving practical problems and holds out for the potential value of theory. "Nothing," he states, echoing a host of theoreticians, "is so practical as a good theory." And, he continues, "an adequate theory of reading should point to appropriate methods of test design and construction and should lead to proper techniques of analysis and interpretation of the results." Professor Popp in this volume also argues for the practical value of theories, noting that at least some theories have very definite instructional implications. As part of her argument, she shows how different theories lead to different instructional programs--programs "beginning with sound-symbol correspondences (Lippincott)

. . . and moving up to syllables and words, phrases and short sentences," or programs, "beginning with sentences, and working down to words and finally letter correspondences (Scott Foresman)." This is certainly true. Different theories do suggest different instructional practices. The problem is that there is a plethora of theories, many of which point in different directions. As Professor Calfee has stated previously (1976, p. 44): "The troops seem in considerable disarray."

This disarray, I believe, must be recognized and acknowledged in any serious consideration of the effect of theory on practice. The knowledge necessary to make informed decisions about competing theories--and hence informed decisions about competing tests and competing instructional practice--is needed by test developers, by those of us who train teachers, by teachers, and by those school officials who purchase tests. Such theoretical knowledge is not currently shared by members of these various groups. In fact, information about the theory behind specific testing procedures is rarely included in test manuals. Moreover, at the present time, including such information in test manuals would probably be of little use. According to Buros (1965), the vast majority of test sales is the result of marketing practices rather than of the quality of the tests. This is not surprising when most test users lack the background knowledge to reasonably assess tests.

Another point Professor Calfee makes is that concern and confusion about testing is rampant. The confusion exists because of the cited inadequacies of the tests for the purposes for which they are often used, and it exists because of the lack of understanding about tests (more specifically about norms) by both school people and the public. Professor Calfee explains the inadequacies of the tests quite clearly, but I think more needs to be said about the lack of knowledge about tests and testing. By way of illustration, I will cite some experiential evidence. At a recent national conference attended by Ph.D. candidates in the language arts, some 20 percent of those present failed to correctly answer a multiple-choice item which essentially asked, "What does a percentile rank indicate?" (Graves & Koziol, 1976). More immediately, in surveys of several of my inservice reading courses, only 40 percent of the teachers correctly answered the same question. If the majority of teachers and a sizeable percentage of Ph.D. candidates do not understand even the simplest statistics used to report test results, then much of the general public is almost certainly confused by reported test statistics.

The result of this confusion is concern, and this concern has different consequences for the general public and for teachers. On the one hand, large numbers of the general public berate the schools for their general ineffectiveness, and half the parents in the country worry because their children score below grade level. The support for schooling wanes. At a time when the decline of the school-age population, the decline of federal support, and rising costs make the schools increasingly dependent on local support, voters are becoming increasingly unwilling to pay for schooling. Parents demand a "return to the basics" and schools respond by dropping innovative programs and replacing them with traditional programs.

On the other hand, a common consequence of teacher confusion about testing is that teachers become extremely wary of tests and test results. One response to such wariness is to ignore test results. In one district in which I taught a class attended by teachers who had volunteered to lead a district-wide reading effort, not one of the teachers in the class knew where the standardized test results were. In another district, the standardized test results of all of the students in two schools were lost. A more extreme response to the fear of testing is to see testing as constituting a serious threat to students. Teachers in a local school are not permitted to see the standardized test results because they themselves voted against being allowed to see them. In still another case, a teacher in a compensatory education program I administer quit rather than give students a 10-minute test on the vocabulary he had been teaching for 6 weeks.

From consideration of the need to deal with theory in order to make intelligent decisions about tests, as well as consideration of the confusion and concern that tests frequently cause, I want to suggest that many of those involved in the teaching of reading need to be better educated than they currently are. In particular, I am thinking of the classroom reading teacher.

Let me hasten to add that I am not placing the blame for this lack of education on teachers. As Professor Bormuth pointed out in his paper, the information exchanged in a learning situation depends both on the receiver and the message. And teachers in this country have been getting an extremely thin message. An analogy based on personal experience may serve to illustrate this point. Some years ago, the army sent me to typing school. That school lasted

4 hours a day 5 days a week for 4 weeks--a total of 80 hours. Though I learned to type during that 80 hours, I did not learn to type very well, and I still have to look at the keyboard to find the keys for quotation marks and other symbols. By contrast, today in 70 percent of the teacher-training institutions in this country, students preparing to be elementary reading teachers receive 30 or fewer hours of classroom instruction in teaching reading (Morrison & Austin, 1977). I think this is absurd and an outrage.

My first perspective on literacy, therefore, is that we need to provide a much better education for reading teachers than we are currently providing and that in order to provide such an education we are going to have to devote radically larger amounts of time to that task than we currently give it.

My second perspective on literacy is closely related to the first. It stems from points Professor Calfee makes about the test for reading single words and about the Interactive Reading Assessment System (IRAS). I will take as a given the model of attention, decoding, and lexical interpretation that underlies the test. But then I have a question. Why, of the myriad factors that might be considered to affect attention, is the specific factor of a quiet room vs. a noisy room tested? Other variables come immediately to mind: time of day (early morning vs. ninth period), span of attention (the first 5 minutes vs. the last 5 minutes in 30 minutes of reading), or topic (current movies vs. nineteenth-century housing costs). Certainly reaction to both room noise and time of day provide us with some information about a student's pattern of attention. But equally certain is the fact that some children would be greatly bothered by room noise and unaffected by time of day, while others would respond in an opposite fashion. And, of course, the reaction to the other indexes of attention suggested will also vary differentially with students.

Similar questions could be raised about the variable affecting word understanding. Familiarity as indicated by frequency is one possibility. But again other variables, such as length and level of abstraction, come to mind.

Turning to IRAS, I have somewhat different questions. I wonder, for example, about the practice of testing only silent reading. I wonder about the reliability of the profiles of question types when relatively few questions of each type can be found. I also wonder about the feasibility of asking children to pick appropriate paragraphs.

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A myriad of other questions come to mind, but here I will only note two more. When I read that one feature of IRAS will allow teachers to assess the effects of giving students prompts, I am curious about many aspects of performance a test can reasonably assess. And when I learn that recognition vs. production is to be tested, I am curious about how teachers will be able to use the results.

Considering this rather long list of questions, I would note that the answers must come from various sources. Theory, for example, provides some information. Theory, as well, tells us something about the relationship between oral and silent reading. And the question of how able students are to pick appropriate paragraphs can be answered empirically. But some of the other questions, such as those about useful indexes of attention or the number of aspects of performance that can reasonably be tested, are best answered by practicing classroom teachers.

This leads directly to the second perspective on literacy that I would offer. Those of us in university teaching and research positions must do more than provide a better education for reading teachers; we must also receive a better education from reading teachers. Real improvement in students' reading abilities is only likely to come when the various persons that affect the reading program--test developers, program developers, university professors, and public school teachers and administrators--work together to improve the assessment and the consequent instruction that students receive.

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RELATING THEORY AND RESEARCH TO READING INSTRUCTION

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Schools are the primary source of formal literacy training in our society. In turn, the primary demand for literacy skills in our society is made by schools. The structure of our educational system makes it necessary for people to read more in school than at any other time during their lives, but our culture also makes demands for literacy skills beyond those of schooling. Our responsibility, then, of helping students to develop literacy skills is a very real one. I would like to discuss the extent to which theory and research[1] can aid us in that responsibility.

I will review selected theories and research related to reading instruction. The perspective will appear to be optimistic, I am sure, for I am a great believer in education.

Benjamin Bloom is perhaps the most optimistic theorist of all. While a discussion of his theory on eliminating individual differences is beyond the scope of this paper, I would like to use his theory of school learning as a framework for my comments.

Bloom (1976) identifies three interdependent variables as central to school learning. They apply as well to learning to read:

a. the extent to which the student has already learned the basic prerequisites to the learning to be accomplished (cognitive entry behavior);

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[1] I note that CEMREL, the national educational laboratory in St. Louis, has been funded by the National Institute of Education (NIE) to establish an interpretation service to develop methods of making research and development outcomes useful to practitioners. Such a venture should lead to clearer statements of direction for both research and practice and we look forward to the results of their deliberations.

b. The extent to which the student is (or can be) motivated to engage in the learning process (affective entry characteristics); and

c. The extent to which the instruction to be given is appropriate to the learner (instruction) (p. 10).

Let us consider these variables as they apply to reading instruction. The first, cognitive entry behaviors, will be touched on only briefly. These have been referred to as reading readiness factors in reading theory. The second, affective entry characteristics, refers to motivation theory. The third, instruction, will be my major emphasis. I include also a section on the theoretical process of reading, the learning task itself, in order to gain further insight into the instructional category.

Cognitive Entry Behaviors

I would accept Bloom's assumption that much of the variation in learning a task can be attributed to "variation in the relevant knowledge, skills, and previous achievement" (p. 32) which students bring to the task. Reading instruction, perhaps more than other academic disciplines, has a long history of attention to this factor. Reading readiness as a concept has been in the literature for a very long time and "educational readiness" has taken its place alongside of "social and emotional maturity" as prerequisites to beginning reading. The current trend is to discuss prediction in terms of such factors as oral language, visual motor organization, pattern matching, and pattern memory (Jansky & deHirsch, 1972). These factors, however, are not unlike the readiness factors adopted into the conventional wisdom in the 1920s and 1930s. Controversy ensues, however, with regard to what these prerequisite skills are, whether they should be taught, and if so, at what age. In spite of such controversy, however, some would disagree with the concept that there are necessary cognitive entry behaviors for beginning reading instruction.

Beyond readiness, the extensive effort to create a hierarchy, to sequence the reading tasks to be learned, and to ensure mastery at each level or step in preparation for the next level reflects an attempt to ensure that students do have the prerequisite skills for each successive task. The extremes of this approach have been criticized (Goodman, 1976a; Popp, 1975). Criticism may be leveled at three aspects of the system. First, breaking reading down into many subskills may cause the learner to fail to gain the broader concept of what reading is all about. Second, the approach requires extensive classroom management, to which many teachers object. Third, there is no evidence that there is one hierarchical arrangement of subskills (NIE conference subgroup, 1975) which applies to all learners.

Unfortunately, time does not permit a review of the related literature. I would like to emphasize, however, that Bloom's first variable--cognitive entry behaviors--is most important and now move directly to his second variable --affective entry characteristics or motivation.

Affective Entry Characteristics or Motivation

Motivation is certainly a critical variable in learning to read, yet the research in this area is most limited and difficult to interpret. Relating generally accepted motivation theory to reading instruction is informative, although one runs the risk of reiterating platitudes. Taking that risk, let us examine some of what is known--for example, the effects of interest and success, their interrelationship with self-concept, and the possible changes in these factors as the student matures. All are important considerations for instruction.

We have come to believe that learning should be easier for a student who approaches the reading task with greater interest. Likewise, we have come to believe that learners are apt to approach a reading task with greater interest if they assume they can master the task. Each success or failure, as perceived by the students, thus affects their degree of interest in engaging in similar tasks, and we can surely conceptualize learning to read as a series of such tasks. Carroll (1971) states:

> Reading skill is not learned all at once . . . [it is] not simply a slow motion imitation of mature reading process. It has numerous components, and each component has to be learned and practiced. (p. 4)

Mastery of each of these components is important for affective as well as cognitive reasons. For young school-age children, the drive to master their environment and specific tasks is very strong. At an earlier age, they may have played at reading and imitated adult behavior. They were not then constrained by accurate recognition, which requires knowledge of exact print-to-sound relationships. They were "reading" the way they perceived adults about them were reading. At age 5 or 6, however, they want to gain competence by learning the rules and following them.

Meyer (1977), in a review of the theoretical literature on child development, concerns herself with the elementary school-age child's need for competence, with particular reference to reading. An important hypothetical construct emerges from that literature for 5- or 6-year-old children. Poor readers are able to maintain a highly positive self-concept even though they do perceive that they are poor achievers in reading. Meyer concludes that the "assembled evidence indicates that the child may not internalize responsibility for his success or failure until at least third grade or age 8 to 9 (Bloom, 1976; Coopersmith, 1967)." This appears to me to be very significant in terms of reading development and suggests that assistance for poor readers would be more readily received by primary students than older students. Generally speaking, attention to younger students is more beneficial. Until recently I had attributed this relatively greater success of intervention in the earlier grades to the fact that in the early grades attention can be focused on the mechanics of reading because the concepts and language used are familiar to the students. The shift to the more difficult comprehension task on less familiar material comes at about third or fourth grade. From motivation theory, we learn that this is the same time at which students begin to take responsibility themselves for their failure. Thus difficulties at about the third- or fourth-grade level involves both of these complicating contingencies.

These same students are especially vulnerable when continually confronted with comments on their poor performance. Meyer restates Rubin's (1971) admonition that an environment in which there is high stress is more apt to result in a maladjustment for the student with reading difficulties. The older elementary student appears to have a more generalized self-perception, and a negative perception in the one area--reading--will likely predispose the student toward an overall poor self-concept. In view of this, it seems critical that in planning reading programs one implement a scheme to relieve students of the responsibility for their past failure, provide for them an opportunity for present success, and encourage them to take responsibility for their own future.[2] Such a plan is not easy to formulate and implement.

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[2] It is not insignificant that dyslexia as a "no-fault

Secondary school students who have never successfully learned to read, although they have been exposed to varying amounts of instruction, exhibit similar problems with motivation. These young people present a great challenge to the school. Most often they are not in literacy training classes by choice. Someone else has had reason to assign them to reading instruction, and the initial confrontation will usually be one of antagonism. Comments such as "I can already read o.k." or perhaps "I can read, but I don't want to, and I don't have to" are common, as are statements that they are not interested in that "baby stuff." These are problems which can be tackled by well-trained, caring tutors who understand some of the reasons for the poor motivation as well as the specifics of the reading problem. As we will discuss later, those tutors and their tutees need a supportive administration that will arrange for the tutoring to occur at regularly scheduled times, in a well-defined manner that is least disruptive to the students' usual interactions with their peers.

Affective characteristics are certainly related to achievement in reading. While "interest" and "success" seem to feed upon each other and thrive under the best of circumstances, stressful situations and failure are associated with disinterested students whose self-concepts suffer. The factors involved in motivation change somewhat as the student gets older, and, as is stated above, early intervention could be expected to be more effective since it appears that children below 8 or 9 do not yet take responsibility for their failure. And while we must nevertheless be aware of motivational factors for younger students, they become even more critical for the older students. The possibility of a generalized poor self-concept makes it even more important to structure the style and content of the teaching situation to accommodate the students' emotional needs in addition to their reading needs.

The Task to Be Learned and the Quality of Instruction

Learning to read is a series of learning tasks, and we will discuss Bloom's factor of the quality of instruction

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malady" brings a sense of relief to both parents and children. It allows the no-self-responsibility to continue and therefore might create an atmosphere where instructional assistance could be more effective.

related to those tasks. Before doing that, however, I would like to digress so that we might inquire into the nature of this cognitive task and discuss briefly some theoretical research related to it. Such research provides a rationale for the attention that should be paid to materials, to methods of reading instruction, and to the way in which these relate to the reading process. I will then return to Bloom's variable of instructional quality and will propose some guidelines for improving instruction. Let us now consider what is being theorized about this process.

Most theorists and practitioners agree on one fact regarding reading: it is an enormously complex process. By reading I am referring to that process by which we extract meaning from print through visual, linguistic, and cognitive abilities.

Let us first get a feeling for how the process "inside the head" might work. There are many elaborate and detailed models of the reading process (Singer & Ruddell, 1976), none of which can be presented now. Rather, a brief overview will stress the complexity of the process and the difficulty we have in understanding how we learn to read. A distillation of many theories suggests to me that it proceeds in the following general manner, once the reader is attending to the task:

1. Sensation

   The eye sees a certain portion of the print. The mind has told the eye where to look and which cues to select and focus on. (Even at this level of sensory input there is selection.)

2. Recoding

   The image is recoded to a phonological semantic, or a possibly reduced visual representation. (This aspect of the process is subject to much experimentation and controversy.)

3. Storage for Processing: Short-term Memory

   The transformed input must be stored in some form for a brief period of time as it is further analyzed and chunked into higher-order units and possibly further recoded.

4. Perception

   A "chunk" of the recoded input is "understood" in some sense; it is perceived on the basis of what has been constructed from the input.

5. Integration and Assimilation: Long-term Memory

   When units have been processed into syntactically and semantically meaningful segments, they may be further recoded, stored, and eventually perceived as even larger units, or they are integrated with previously acquired knowledge and assimilated into long-term memory.

Recoding, storage, and perception provide feedback each to the other and the effect on sensation from what is integrated and assimilated is critical. That is, the process is not to be construed as unidirectional. Most certainly there are controversies surrounding theory on the reading process, and experimentation continues to assess the validity of varying theoretical positions.

Research and Theory

Research has established that we are able to—and do—focus on and "sense" or see different units of print: individual letters, letter clusters, syllables, words, phrases, and possibly short whole sentences.

letters	c h a s e d o g s
letter clusters	ch ase og
syllables	gar den flow er
words	the chase dogs
phrases	chase the dogs
sentences	He chased the dogs.

These are units which the eye can sense, which are registered on the retina. But theory and research have been inconclusive in determining what the mind sees or perceives.

Our reading instructional programs probably affect what beginning students attend to (or focus on) in the print, and there is evidence that students do attend to different cues under differing sets of circumstances (Amarel, Bussis, & Chittenden, 1976). Flash card presentations of isolated words prompt different perceptual skills than does practice in reading known words in context, and both are different again from decoding unknown words on the basis of known print-to-sound relationships. It would seem that instruction should be given which prompts each possibility and which requires students to use parts of words and whole words under different circumstances. Many of our best teachers will shrug their shoulders and say, "Naturally, we've been doing that for years." But some theoreticians will argue that it is not necessary to be concerned about utilizing both parts and wholes (i.e., letters and words). Some will argue for the necessity of perceiving the parts sequentially in order to perceive the whole (Gough, 1972). Others will argue for perception of the wholes, without the parts. There are parallel considerations in the process of recoding these segments into their corresponding phonological units as well.

We know that we are able to produce different-sized phonological units. It is difficult to discern which we actually do produce as readers when we are confronted with print, or to know even if we recode into speech at all. These are important empirical questions (Conrad, 1972; Gough, 1972; Mattingly, 1972) which have received their share of research as well. We assume that once the beginning reader, who knows the language, learns to recode from the print into speech, the meaning of the text becomes apparent--if the speech units produced by recoding are large enough chunks to access meaning. Thus some argue that instruction should focus on recoding large chunks as soon as possible in order to more readily extract meaning. Essentially this argument provides the rationale for a theory of instruction which begins with sentences or, at the very least, words. Symbol-to-sound relationships of words are "given" to the learner who memorizes them on the basis of visual cues (largely unknown to us) until a large repertoire of known words is established. Eventually enough words are known to provide the context from which one can "guess" unknown words and phrases. In this "top-down" instructional model, story or sentence meaning is assumed to be already in the learner's head, or it may be attained from pictures or from pre-story discussions. The theory suggests that meaning is the cause of, rather than the result of, recoding (Smith, 1973). Furthermore, incorrect recodings of print into speech are perfectly acceptable as long as meaning is maintained. Thus reading "supermarket" for "store" is an error which indicates that the reader has understood the message; the oral recoding is almost irrelevant (Aaron, Artley, Jenkins, Manning, Monroe, Pyle, Robinson, Schiller, Smith, Sullivan, Weintraub, & Wepman, 1976).

According to Chall, the Goodman (1976b) model just described fits the pre-reading stage and her proposed Stage 2, confirmation and fluency. It is doubtful whether his theory can cover either Stage 1 (decoding) or Stage 3 (reading to learn)--both of which require more accurate reading. According to Chall's developmental stages (Chall, in press) and other theorists (Ruddell, 1976; Shankweiler & Lieberman, 1972), the major task for the beginning reader is to learn the sounds associated with smaller graphic units. After the print is thus recoded into speech, meaning is derived (a "bottom-up" model).

The research in theoretical processes has been slow to make its effect on instruction, with a few exceptions such as Levin's "set for diversity" (Gibson & Levin, 1975). One reason is that we have recognized that the experimental situation is itself atypical. There are differences in the materials used, differences between conditions surrounding the experimental task and those of the normal classroom, and differences in the age and abilities of the experimental subjects compared to beginning readers.[3] These differences between experimental and instructional situations cause us to interpret experimental research with caution. Yet research generates hypotheses for reading instruction. Let us look at two areas of theoretical research as examples and see what suggestions for instruction have been implied: (a) chunking and memory and (b) context.

Chunking and memory. Comprehension is aided by the ease with which the reader can chunk reading units into larger perceptual units in order to remember them, manipulate them and integrate them with prior knowledge. Theory and research has it that our short-term memories have a limited capacity, seven bits plus or minus two (Miller, 1956). It would appear to be easier to store and process seven words which reconstitute a meaningful sentence than to store and process seven phonemes which would reconstitute a word. Hypothetically, when one is processing a string of words and comes to an unknown word, the processing switches to chunks smaller than a whole word. These chunks then have to be stored in short-term memory for processing. It is likely, then, that the earlier words in the string which were being processed are lost from short-term memory by this interfering storage of phonemes for the unknown word unless it can be processed quite rapidly--or automatically. Proficient readers, then, build automaticity into their reading skill so that they can readily recode unfamiliar words and readily chunk those words into sentences (LaBerge & Samuels, 1974).

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[3] For example, findings from an experiment involving same/different responses to pairs of visual stimuli presented tachistoscopically to adult subjects in a laboratory setting may not be entirely relevant to reading responses expected of the young child in a classroom.

Context. As youngsters read, they usually recode from visual to auditory in left-to-right sequence across the line of print. When they begin the line, there are already some "data" available: previous knowledge of story content, previous discussion of the story, pictures, and so on. Therefore the students have certain expectancies of this particular test. Before they even begin to read, students have these larger contextual cues. Then, as soon as they do begin recoding, the data change and printed contextual cues are available. For mature readers, the expectancies may sharpen to the point where they do not even have to look at (i.e., visually sense) much of the text at all, because the input includes syntactic and semantic awareness of what precedes in the text. It is hypothesized that the more readers operate on syntactic and semantic cues, the less they depend on the visual. Similarly, if they have to attend in detail to the visual, it is less likely that they will make as much use of the syntactic and semantic, and reading will be even more dependent on the visual. Kolers (1972) has demonstrated this point dramatically by giving adults mirror-image text where they had to attend to recoding from the visual stimulus. The information-processing system was taxed so that the readers could not handle comprehension well. Analogies were drawn to a similar situation for beginning readers who would have to attend closely to the recoding process and may not be able to attend to comprehension at the same time.

This evidence on the way in which readers use context implies the necessity of operating on several levels simultaneously: readers must attend to both the sensory and contextual levels. Both contextual and sensory data must match in order for the reader to produce the words which the author used for communication. At the more advanced stages of reading, if sensory data do not conform to a prediction based on context, they can be ignored. Or the more advanced readers can reconcile the nonconformity by attending closely to the graphic input (i.e., by using the context of letters to recode a word). As skilled readers, they can do this. It seems logical, then, that instruction should be given to provide readers with practice in both. Oral error research (Biemiller, 1970; Weber, 1970) indicates that children do use both and that errors are more apt to conform to graphic, syntactic, and semantic constraints as the young readers mature. But the obvious question is, "How can the readers use sensory information at all unless they have built up a phonic repertoire either deductively or through direct instruction?"

Conclusions on theory and research related to process. A model of the reading process for the beginning reader must include the notion that the task of the beginner is to build knowledge of phonetic equivalencies for graphic symbols at the letter, syllable, or whole-word level. This has to be learned. It may be learned deductively by many children; certainly those who learn to read with great ease and without any apparent instruction in "phonics" learn to master the code easily. But for some, the relationships have to be taught systematically--and they may be taught in a variety of ways: by beginning with sound-symbol correspondences (Lippincott) or larger chunks (SRA) and moving up to syllables and words, phrases, and short sentences. Or, instruction may come in the other direction as well, beginning with sentences and working down to words and finally letter correspondences (Scott Foresman). As we know, a choice of materials exists, and one can first focus primarily on any one of these different levels of symbols: one can use published materials to start at either end and work to the other, or start in the middle and work toward either end.

The intention of this brief digression to discuss process was to emphasize that research has certainly alluded to theoretical alternatives in processing. Alternative materials and methods are available. Individual children experience difficulty with different tasks, at different points in the process. I am convinced that more flexibility and sanguine use of materials will result in altering our previous conclusions regarding materials. Research on ability-interaction theory will show that materials and methods for a given individual do, in fact, make a difference. And the more we understand about process, the more likely we are to improve the quality of instruction.

School and Instructional Variables

Let us now turn to the research on instruction in this complex process and relate that research to theory also. What findings do we have from research related to school variables that may help us improve the quality of instruction? Bloom (1976) theorizes from past research that quality of instruction accounts for 20 to 25 percent of the variation in student learning. We will discuss those characteristics which he stresses following a review of some of the research. The literature on schooling and its effects includes four research foci: program comparisons, teacher characteristics, correlational analyses which relate school or environmental characteristics to learning outcomes, and classroom observational studies. We shall consider findings in each category and isolate evidence which might give educators a better sense of how to promote greater reading achievement.

Program comparisons. First, research comparing outcomes from different types of reading programs has not been particularly helpful. Differences between classrooms within each program have often been greater than the differences between programs (Bond & Dykstra, 1967). Chall (1967) placed beginning reading programs on a continuum of meaning-emphasis to code-emphasis programs and then analyzed results of the studies from that perspective. She thus came closer to finding real differences but nevertheless qualified her conclusion in favor of code-emphasis programs:

> But the major evidence that a stronger code emphasis at the beginning produces better results than a weaker one (one that emphasized meaning initially) stems not from "head counting" or "ballot taking" but from my theoretical analysis of the probable course of development of reading skill when children are given more or less instruction in the code system of English writing.... The studies are used as confirmations or denials of this theoretical position. (p. 134)

Chall (1977) also advances indirect evidence favoring the code-emphasis approach in the comparisons of the reading achievement of children in the early grades with those of 5 or 10 years ago. Today's children are ahead, and she hypothesizes that stronger decoding programs and other changes resulting from that emphasis have made possible the earlier development of reading skills.

Teacher behavior. This research has found no consistent relationships between teacher characteristics and outcomes for children (Rosenshine, 1971). Bloom (1976) summarizes these studies and states that "teacher characteristics rarely account for more than 5 percent of the achievement variation of their students--and usually much less." (p. 110)

School characteristics studies. Characteristics of the classroom or schools in the Coleman (1966) report accounted for not more than 5 percent of the student achievement variation. His report and other analyses of his data (Jencks, 1972) indicated that the socioeconomic status of students is the overpowering variable, and once it is controlled for, the other assessed characteristics contribute little to the variance. Criticism of this study has been leveled from various directions, and it is encouraging to see Samuels and Edwall's (1976) review of other evidence which concludes with a more optimistic summary. Five of the recent studies which they reviewed were concerned with reading programs and variables associated with them:

1. The American Institute of Research (Bowers, Campeau, Roberta, & Oscar, 1974) identified seven successful elementary reading programs which were approved for packaging and dissemination by the Right to Read Program.

2. George Weber (1971) selected ghetto schools where the third graders achieved a national grade norm score as a median of the Basic Test of Reading Comprehension and where the percentage of gross failures was low. School characteristics of these sites were compared to other less successful ghetto schools.

3. The New York State Office of Education (1974) initiated a study to determine what specific school factors influenced reading achievement.

4. Harris and Serwer (1966) found that gains in reading achievement were more highly correlated with the amount of time spent teaching reading and its supporting activities than the type of approach used in reading.

5. The RMC Research Corporation selected six Project Information Packages (PIPs) to disseminate effective material from 2,000 projects considered (Tallmadge, 1974).

Samuels and Edwall (1976) reviewed these studies to find factors common to the successful reading programs.

They acknowledged that there was a lack of comparability among the studies and thus offered only a tentative proposal for successful reading programs. However, at an organizational level they suggested "strong administrative leadership, cooperation and involvement of staff in planning a coordinated reading program, and an atmosphere of success" where "fiscal resources are predominantly invested in personnel rather than facilities per se," thereby offering "acceptable pupil-teacher ratios, teacher aides to assist in individualizing instruction, and often a reading specialist or program coordinator" (p. 31). At an instructional level, they concluded that "it is abundantly clear that no one method of reading instruction is consistently superior" but that

> successful programs break the reading task into subskills or units (note also the frequent inclusion of a "phonics" component) which are specifically sequenced; the student moves through these units at an individual pace and must attain mastery of each before moving on to the next. The continuous feedback resulting from such a system further becomes reinforcement for the student and a diagnostic aid for the instructor. (p. 32)

They conclude, with regard to elementary schooling, that "A successful reading program . . . must include these properties as rudimentary; an administrative concern with reading and a carefully structured program may indeed be the crucial variables in showing that schools do have an effect on reading achievement of their students." (p. 32)

NIE also reviewed the literature on the effectiveness of instructional program characteristics (Evaluating Compensatory Education, 1976) for elementary grades. It identified the following program features for further exploration because evidence was available that they were related to academic success in reading (and mathematics): individualized instruction, amount of instructional time, teacher training, and instructional setting (part IV, p. 4).

I should also like to report briefly on the findings from a recently completed study that Marcus Lieberman and I undertook with NIE support (Popp & Lieberman, 1977). Individual pupil pre- and post-test reading achievement data were obtained from 36 communities where ongoing special reading programs had been located through an extensive search of the literature. Extensive analyses were conducted on data for the lowest achieving students at each grade level to determine relationships of instructional variables to gain scores on reading achievement tests. These analyses indicated that at all grade levels, instructional variables did account for a considerable proportion of the variance[4] in reading achievement scores for the low achievers beyond that associated with socioeconomic status (SES) and ethnicity. The amount of variance in achievement gain scores that was associated with SES and ethnicity (10 percent to 36 percent) was influenced by the composition of these low-achieving groups (i.e., the range of SES was narrow and all ethnic groups were not represented at every grade level). While our conclusions can apply only to the contrasts of SES and ethnicity that did exist in our data, these data suggested the hypothesis that "students from various SES and ethnic backgrounds can be expected to differ in achievement gain scores depending on factors other than SES and ethnicity!" (p. 57).

Since data on the instructional variables were highly intercorrelated, partial correlations controlling for SES and ethnicity were first computed for the promising school variables. Based on these correlations and on analyses of variance, the following hypotheses were posed for Grades 2 to 6.

1. Individual and small group instruction will yield higher gain scores on reading achievement tests for low-achieving students.

2. Programs for low-achieving children offered by reading specialists will yield greater gain scores on reading achievement tests than other programs.

3. Relevant teacher training will enhance lower achieving students' gain scores in reading achievement.

4. Parent involvement is a positive aspect of reading programs for low-achieving students and parent advisory councils are an effective means for involvement.

In addition to these hypotheses concerning program variables, certain other program characteristics were also powerful predictors at certain grade levels. The most effective location for instruction was a "reading laboratory or resource room" for the earlier grades while the fifth-grade students "in classrooms" had the highest gains. Consultants for program design or evaluation and feedback were associated with higher gain scores for all of the low groups except one at the third-grade level. Each of these variables needs to be researched further to determine if a causal relationship exists and to determine what other circumstances might be highly interrelated.

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[4] Between 12 percent (second grade) and 24 percent (fourth grade).

In the 14 programs which had the highest gain scores for the low achievers, we believe that these effects were produced by management of the instructional process so that pupils had individually prescribed instruction based either on diagnosis or continuous assessment (e.g., criterion-referenced tests). We also concluded from descriptions of these 14 programs that successful programs are apt to be unique to their own community (e.g., the most important personnel associated with each project may not hold similar positions, or the resources available may be important but dissimilar).

Observational studies. Many researchers have advocated observational studies of the classroom to identify the school variables which make a difference in achievement (Amarel et al., 1976; Barr, 1974-75; Popp & Lieberman, 1977; Resnick & Leinhardt, 1975; Samuels & Edwall, 1976). When the U.S. Office of Education's First-Grade Studies were undertaken, only one of them (Chall & Feldmann, 1966) included systematic, extensive classroom observations. Chall and Feldmann concluded that teachers did make a difference in the reading achievement of first-grade children and strongly recommended that other observational studies be undertaken; the most significant was done by Stallings (1975), who observed Follow-Through classrooms in 36 cities and towns across the country. In each community, four first-grade classrooms and four third-grade classrooms were observed for three consecutive days, and classroom practices were related to academic, social, and attitudinal outcomes. She found that certain aspects of classroom practice are clearly associated with certain kinds of effects on first- and third-grade children. After controlling for ability at school entry (WRAT scores), between 20 percent and 40 percent of the variance in the MAT reading test scores was related to process variables:

> The length of school day and the average time a child spends engaged in a reading activity are related to higher reading scores in both first and third grade.... Higher reading scores are also found in classrooms where there is more reading or

> discussions of reading between adults and children. Thus, opportunity and exposure to reading have an important relationship to good performance tests.... Higher reading scores were obtained in classrooms using systematic instructional patterns where the teacher provides information and asks a question about the information. (p. 100)

Two other factors also contributed to higher reading test scores: positive reinforcement for the child who responds correctly, and teacher guidance in achieving the correct answer for the child who responds incorrectly: "Small groups were most effective for teaching first-grade reading, while large group instruction worked well in the third grade" (p. 100).

Another recent study directly related observed behavior of second- and sixth-grade teachers to achievement. For achievement in decoding at the second-grade level, McDonald (1976) found that an effective practice consisted of class instruction followed by teacher-pupil interaction where the teacher moved about the room. A different behavior was associated with success in reading comprehension at the sixth-grade level. There a pattern of explaining, discussing, and questioning was the effective interaction strategy. One important result of McDonald's study was that no "single skill or teaching performance was found to be equally or comparably effective in both grades.... Teaching performance that correlated significantly with changes in learning were different by subject matter and by grade level" (p. 20). His findings suggest that future teacher behavior studies must be specific to grade level and subject matter.

Summary of research related to school variables. Correlational studies are a first step only in producing viable hypotheses for efficient educational policies and procedures.

With certain cautions, then, the research cited suggests to me that the tenor of the program as well as specific variables are effecting higher scores on reading achievement tests. Successful programs seem to include: (a) adequate personnel for low pupil-teacher ratios with small-group or individualized instruction, particularly for the lower grades; (b) greater time spent on the reading tasks; (c) a cooperative effort--administrative support, parent groups, staff planning, reading specialist or program coordinator, and consultant; (d) a structured program with attention to subskills, particularly for lower grades; and (e) teacher training.

Let us now relate these findings to theory on quality of instruction.

Theory on Quality of Instruction

Carroll (1963), in his model of school learning, defined quality of instruction in terms of the degree to which the presentation, explanation, and ordering of the elements of the task to be learned approach the optimum for a given learner. Bloom (1976) stresses the following characteristics of quality instruction: cues (information to the learner as to what is to be learned and what he or she might do about them), participation (practice) and reinforcement with feedback, and corrective procedures (usually alternative cues, additional time, and practice). He points out that the optimal quantity and quality of these vary considerably for individual students. In a tutoring situation, the astute tutor is continually adjusting these variables to suit the learner's needs, and in experimental classrooms we can expect these procedures to be quite effective in altering the learning achievement of students (Block, 1970). As we mentioned earlier, Bloom's theory estimates the effects of quality of instruction to be 20 to 25 percent or more of the achievement variance. Although this is a theoretical estimate, it is based on earlier research. My own conclusions--from the research on the effects of school variables on reading--add more credence to the hope for creating better learning situations.

Bloom hypothesizes the following effective characteristics: cues, participation and reinforcement with feedback, and corrective procedures. All would be enhanced by three of the components suggested above: low pupil-teacher ratio, greater time on reading, and a structured program. The two other components suggested above (a cooperative effort with administrative support and teacher training) could easily be conceived of supportive of Bloom's positive characteristics.

Certainly more research is needed to study these qualities of instruction, and we hope it will be carried out in classrooms where specific interactions may be observed and recorded.

Conclusions

In this brief review of research and theory related to reading instruction, I have considered the factors that make for optimal learning: (a) the cognitive entry factors--what readers come with, (b) the motivation of the learner, and (c) the instruction received, as well as the task. Many other areas of theory and research have gone unmentioned. From what was considered, however, I feel optimistic that as we have more research and as we gain more understanding of the reading process, particularly in the school environment, we will be able to guide the timing and the content of intervention practices more effectively. The literacy level of all individuals should be positively affected, but our particular interest is in those who need greater assistance in developing reading skills.

To date, research efforts have successfully isolated variables which *relate* to achievement. More research is needed to find out if they directly cause higher gain scores. I would think, then, that educators who are planning to implement revisions of their reading programs must pursue further considerations. For each favorably related characteristic, one might want to consider (a) the similarities between one's own community and the community where the factor or factors had a positive effect, (b) what other factors are considered important in one's own situation which were not part of the cited research study, and (c) what probable forces influenced the positive findings in the research study which are not present in one's own situation. Once considered--and a decision made to implement a particular policy--then evaluation is the key concept (and problem). Careful evaluation on the effects of the change in one's own situation is necessary to answer the practical questions. It will also add to the mounting store of information factors related to successful programs. I would certainly recommend that teachers and administrators seriously discuss the implications of Bloom's model and pay particular attention to instructional characteristics.

My final point is that with current knowledge we do not have to wait for further research and theory to improve the quality of instruction. We should, instead, be eager to participate in such research. We should be eager to create research on changes in practice as we adapt our school environments to meet the challenge of better quality in the instruction of literacy skills, and it is indeed our challenge.

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EDUCATIONAL FACTORS AND ILLITERACY

RESPONSE TO HELEN POPP

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In her discussion, Professor Popp cites Bloom, who has estimated that quality of instruction accounts for as much as 25 percent of the variance associated with levels of student achievement in reading. If this estimate is accurate, the correlation between student achievement in reading and estimated quality of instruction is at the approximate magnitude of .50. Further, one could speculate that such a relationship between two variables could be a major factor contributing to varying states of illiteracy. It is perhaps too simplistic to conclude that a significant portion of the cases of illiteracy could be the result of inadequate or inferior instruction, but it is at least a speculative proposition. Inadequate instruction involves a myriad of factors. Some of the factors relate to teaching, others to materials; and yet other factors, such as methodological approaches and school organization patterns, operate together to create conditions contributing to illiteracy. After 6 years of careful observation in American schools, Durkin (1975a) observed some of the following practices:

> Teachers were found spending time on unnecessary and even erroneous instruction and such instruction often was the result of an unquestioning use of basal reader manuals, and basal reader and other workbooks. (p. 13)

Durkin concluded that teachers were becoming slaves to materials and offered the following remedy for this situation:

> Unquestionably, a resolution to become more knowledgeable about reading and reading instruction is the first step they must take. . . . A second step for remedying the problem of irrelevant instruction is to clarify their own role insofar as materials are concerned. In the classrooms I've been de-

> scribing, teachers were an assistant to materials. That is, they had allowed materials to dictate what would be taught and how; all they themselves did was to help carry out the dictates. Clearly, this is a serious confusion in roles, one that must be rectified for it turns a professional person into little more than an educational clerk. (p. 17)

When one examines instructional practices in American schools there is sufficient cause for concern. These conditions ought to be remedied. Thus, it appears that the war on illiteracy should be waged in school classrooms.

Many writers describing the tasks of reading begin with a theoretical model describing processes. Reading, they find, is a complex act involving interrelated cognitive and linguistic factors. That it is a set of visual, acoustic, cognitive, and linguistic acts is not the question. The inordinate time spent identifying these factors may mask some of the real instructional issues involved in teaching young children to read. That is, by engaging in academic debate regarding the components of the reading process, we may lose sight of our real task--that of stabilizing instruction and doing better what we already know works. For example, most models of the reading process are highly complex, integrative diagrams describing various components of the reading process (Singer & Ruddell, 1976). The models are normally created with the adult reader in mind--frequently the author of the model. While they aid in research processes, they seem to be of limited instructional usefulness. I concur with Professor Calfee's observation that "reading is perhaps not so intricate after all. . . . Teaching a child to read is sometimes a demanding task, but many teachers succeed at this task year after year." Perhaps what we ought to be concerned with is doing those things which we know work, and doing them better. We perhaps need more basic research in identifying and quantifying those tasks that good teachers do well. Thus, from my point of view, the relevant question is: "How does an individual become literate and what are the hallmarks of good teaching?" I propose that the following variables are to a certain degree controlled by teachers. That is, teachers and educators may exercise some judgment with respect to the amount of emphasis given to each factor. If improved upon, each could reduce components of illiteracy.

Pedagogical Variables

Pedagogical variables are defined as components and practices of excellence in teaching. To some degree they are controlled by teachers, but they also need further elucidation, refinement, and definition by educational researchers and writers.

We first need to identify the critical variables in the learning-to-read process. These variables, once identified, need to be translated into instructional practices. While it remains to be seen that we can completely identify such practices, writers have begun to explicate such variables in the beginning-to-read process (Dahl & Samuels, 1977). The procedures used by these writers illustrate that the hypothesis/text model of recognition of printed words is facilitated when students are presented printed words with which they have had previous contextual experience. Students may then use context first to predict appropriate letters and then words. The writers recommend that instruction begin at the oral language level. After mastery of each skill, the same skill is reintroduced at the visual level. The writers have demonstrated experimentally that such a task analysis process, based on theoretical constructs, provides significant aids in acquiring basic decoding skills. They further indicate that the skills are sequential and hierarchically related. This type of research, related to improving instructional factors, needs to be further amplified and translated into sound teaching practices.

Once basic variables are identified, it becomes crucial that they be presented in a systematic manner. This is not to imply that a scope and sequence of skills adhered to rigidly is the appropriate teaching procedure. Rather, it is suggested that the crucial basic skills be emphasized to the point of mastery. Durkin (1975b) points out that this crucial skill reflects the ability of the child to understand the visual nature of reading--that is, recognizing that printed language represents the spoken language over which beginning readers have sufficient command. The hierarchical sequences of beginning reading skills emphasized by Dahl and Samuels (1977) explicates similar processes (i.e., translating written symbols to spoken language). We also know that instruction in these skills needs to become a matter of emphasis and degree. For low-achieving students, for example, more emphasis on decoding types of skills appears to be appropriate. Word recognition scores taken at the end of the school year showed significant gains in two Minneapolis and St. Paul metropolitan suburban districts when decoding skills were emphasized with low-achieving students. The instructional emphasis was again directed toward the mastery of crucial symbol-to-sound correspondence skills. To illustrate matters of emphasis and degree of decoding instruction, Lamb (1975) observed:

> It seems important to take into account a child's level of linguistic development. He need not be taught that which he already knows nor should he be frustrated by that for which he is not ready. . . . It is suggested that different children learn phonics, like everything else, differently and that one sequence, unless it is broad and general in nature, is unlikely to be appropriate for all pupils. (p. 18)

Consistent with practice to achieve mastery with basic skills, some of the following pedagogical practices may be useful--particularly with low-achieving students--in reducing illiteracy:

1. Insist on mastery learning at each instructional level before proceeding to more complicated tasks or skills.

2. Spend more time in practice and reinforcement activities than called for with activities that accompany basal reading materials.

3. Provide consistent practice at appropriate levels. This may mean teaching and reteaching of basic skill components.

4. Allow students more time to read and thus practice the skills of reading. This may mean using materials in a free-choice, unencumbered setting. In order to practice application of skills, select materials at comparable levels of syntactic and semantic complexity. Free choice and interest level ought to be main factors used in this selection.

5. Emphasize individual student assessment and evaluation. Assessment, of course, relates achievement to mastery of the skills presented in the learning-to-read process. Both formal and informal measures are useful. Two aspects of evaluation are important:

(a) That the student be apprised of his or her progress. Thus, both students and teachers must share in the responsibility for mastery of the basic skills.

(b) That the instruments used reflect a high degree of content validity. Thus, the results can immediately be translated into corrective practices by the user or teachers. It would appear that teacher-made instruments would be most appropriate for this aspect of diagnosis.

Methodological Variables

Methods refer both to how content is provided for students and the manner in which it is done. In reading instruction, controversy has long continued over how decoding skills should be presented to students. Advocates of the synthetic or synthesizing approach contend that direct instruction in symbol-sound relationships should be provided as a vehicle for decoding unknown words. On the other hand, the analytic method suggests that after a corpus of words is taught as whole elements, students may generalize to newly encountered words those familiar aspects of symbol-sound relationships.

It is not my intention to settle the controversy but to suggest that different methods of teaching word-recognition skills would be more appropriate for different groups of students, depending upon their levels of achievement. Thus, it does not involve a decision about phonics vs. whole-word instruction but rather a matter of emphasizing skill instruction. The research literature supports the notion that students master decoding skills at different rates with varying amounts of practice (Bleismer & Yarborough, 1965). Thus, it seems that code emphasis approaches are more appropriate methods for students of low-reading achievement. However, varying the teaching methods places additional loads on teachers.

In addition to varying teaching methods among groups of students, it might also be appropriate to vary methods of instruction within achievement levels. That is, low-achieving students are not the only individuals who ought to receive intense instruction in basic skills. For example, synthetic phonic methods may be highly appropriate for specific skill instruction. Such intensity would be useful for mastery of various aspects of symbol-sound correspondence (Schreiner, 1977).

School Organization Variables

Grouping practices and physical conditions of instruction appear to have varying effects on student achievement in reading. Professor Popp has spoken extensively about those school organization variables that have a positive effect on reducing levels of illiteracy.

One striking, but rather obvious, finding in Professor Popp's discussion deals with providing instruction in reading to students in individual or small-group settings. One ought to be able to generalize this finding to school settings and suggest that pupil-teacher ratios, especially for low-achieving students, be lowered. This seem particularly relevant to those students in primary grades. Most findings that assess academic growth as a result of pupil-teacher ratios have not, however, demonstrated that lower ratios aid achievement. However, these implications are frequently the result of post hoc analysis. Perhaps we need to ascertain the effect of lowered pupil-teacher ratios more systematically. Thus, in long-term studies where pupil-teacher ratios are established at, say, 10, 15, and 20, it would be useful to determine whether lowered numbers of students in classrooms would have a positive and significant effect on reading achievement.

Teacher Variables

As Professor Popp indicates, the research literature on the relationships between teacher characteristics and student achievement has not been particularly fruitful in establishing clear evidence of the effects of teacher behaviors. However, after perusing the literature--and considering this conference to be a forum for perspectives on literacy--I would like to conclude with some generalizations about teacher characteristics that would aid in combating illiteracy. In order to reduce illiteracy in schools, we need more teachers who (a) understand language development and its relationships to reading instruction, (b) are able to translate the underpinnings of language development to appropriate reading tasks to bring about mastery in reading, (c) create an atmosphere with high but humane expectations for student performance in reading, and (d) use a variety of materials and techniques to supplement basal reading instruction.

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Perspectives on Writing

INTRODUCTION

John Mellon's paper provides a useful summary of the major developments in theory and research in composition instruction in the past two decades. Mellon characterizes one major development as a movement in composition instruction away from instruction based on limited and arbitrary rules to teaching that appreciates the composing process. In his understanding, complexity involves research in five areas: (a) discourse structures, (b) developmental research (based on Moffett's and Britton's developmental theory), (c) analysis of writing behaviors at various stages of the composing process, (d) analysis of the relationship of various instructional techniques (sentence-combining, improvisational drama, talk-write activities), and (e) composing and development of more valid criteria for describing or scoring writing than at present.

Mellon then presents a taxonomy of compositional competencies, a composite of the various abilities that contribute to growth in composing. These include vocabulary; syntactic fluency; recognizing part/whole relationships; logical and semantic relationships; the discovery, expression, and recall of ideas; the ability to adhere to certain discourse conventions constituting writing such as that done in schools; the ability to use pre-writing; and the need to define purpose, to self-assess, and to revise.

Richard Lloyd-Jones's analysis of various sources of knowledge about composition echoes Mellon's concern over the tendency to rely too heavily on empirical research for insights into composition instruction. Lloyd-Jones argues that research should be combined with centuries of scholarship on rhetoric and language, creating a healthy skepticism about the limitations of composition research. As an example of these limitations, he cites the use of tests that claim to be valid measures of writing ability but which are actually tests of vocabulary and usage rather than writing. Another limitation in composition research is the use of various criteria for describing or scoring writing ability--criteria, he argues, that do not rest on any theoretical base or model of discourse. Measures of writing ability are further limited by the fact that writers in the context of taking such tests are not writing for any actual purpose or audience but are only conforming to the artificial dictates of the tests. While he certainly perceives the value of research on composition, Lloyd-Jones is concerned that composition research suffers from a parochial attitude towards theoretical scholarship.

In his response to Mellon and Lloyd-Jones, Martin

Steinmann agrees with both of their papers, that understanding the various complexities of writing poses a number of difficulties for researchers. Steinmann distinguishes between "knowing-that" competence--a theoretical knowledge of the conventions constituting writing--and "knowing-how" competence--a practical knowledge gained from the experience of writing. While it may be easy to test for one's theoretical knowledge, it is more difficult to determine the extent to which writers possess a "knowing-how" competence. Steinmann therefore suggests the need for research on what behaviors constitute good writing. Such research would also examine both a writer's ability to consider the degree to which a reader will understand that writing and the ability of writers to consider the influence or effect on readers.

Harriet Sheridan's response echoes the other papers' interest in defining the abilities that constitute good writing. Drawing on her own teaching experience, she argues that extensive reading and writing, the development of an ear for language and enthusiastic writing teachers are essential to effective writing instruction. She is critical of traditional methods that are often equated with the "basics" and the increased use of tests which, in turn, dictate the curriculum.

A TAXONOMY OF COMPOSITIONAL COMPETENCIES

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Introduction

Comprehensive strategies for teaching a complex skill are best formulated against a detailed background analysis of the targeted learning. Such is the case in the teaching of writing. In this paper I have identified a number of competencies brought into play in composing written English. I do not claim exhaustiveness or that we have precisely described these competencies or the specific conditions promoting their acquisition. But I do think that research on language and learning, augmented by commonsense observations, points to their existence as separate factors in one's repertoire of verbal abilities. Furthermore, I believe that our most valid decisions about the teaching of writing will be those we make in as broad yet as balanced and finely delineated a view of these competencies as we can entertain.

Instructional Theories

Some educators, of course, think in terms of instructional theory, which would be considerably more powerful than a mere roster of competencies. But, in fact, we have no theories of teaching. Hunches and hypotheses are not theories. Last semester's successful lesson plans are not theories. Observations of externalized behaviors of persons engaged in composing are not theories. Statistical tabulations of syntactic structures are not theories. The classroom practice of professional-writers-turned-teacher is not a theory. Even the most ingenious schemes for categorizing the spectrum of discourse, popular from Aristotle to rhetoricians today, are not instructional theories.

Some years ago, in the early days of Chomskyan psycholinguistics, when new linguistic insights were exploding like rockets in a fireworks finale, someone took a poll on how soon we would know enough to formulate a confirmable theory of language teaching. Surprisingly, estimates ranged from 100 to 500 years, depending upon a breakthrough in biochemistry or telepathy. For the moment, therefore, we should forget about theories of teaching, and content ourselves with examining the fruits of learning research.

Pitfalls

Whenever someone speaks about the "findings" of language research, I recall Uncle Terwilliger's advice on eating popovers: spit out all the hot air you can, and still be careful what you swallow. Considering the quackery that sometimes passes for serious inquiry into language, one might think this a good rule to follow. There are still many teachers who cannot get the odious scientism of some kinds of research unstuck from their craws--its jargon, its mathematics, its empirical method. But the truth is, today's composition research is better than many of the persons reading it. To put it another way, the hot air to be spat out comes mostly from ourselves rather than the popover.

What I mean is that we suffer from misguided expectations, from a wrong view of what the bottom line of a research study should say. Somehow we have gotten it into our heads that a piece of research ought to end up by giving us at least a classroom gimmick, or better yet "an approach" to teaching something, or maybe even "the answer" to a large educational problem. In fact, research tells us only about learning--even research in the form of experimental tryouts of particular classroom activities. Why? Reflecting a moment, we see that any decision we make about teaching, whether rational or intuitive, is made against a background of all that we know about learning, and the only way the results of a particular teaching decision can be generalized is by feeding back and adding to that background knowledge of learning. This is why theories of teaching are still so far in the future.

Unfortunately, because of our misguided expectations and the difficulty of bringing the whole background into perspective as the only foreground, and because so many researchers grow overly enthusiastic when they come to writing up implications for teaching, not a few curriculum developers and teachers have been lured by recent studies into silly one-dimensional faddish excesses. Consider the current scene in composition teaching. Some teachers, for instance, have allowed a newly awakened concern for the pre-writing stage of composing, valid as it is, to dominate their teaching to the virtual exclusion of attention to editing skills. But it is as bad to get stuck at one end of a pendulum as the other. Others, in response to proselytism coming originally from Great Britain, now sponsor so much expressive writing that they never get around to the expository--and thereby, in my view, toss out the baby with the bathwater. Still others are misguidedly trying to build entire composition programs around sentence-combining practice, as if sentences and discourses were coterminous. Faddishness, nearsightedness, vulnerability to the hard educational sell coupled with a naive belief in simple solutions, and often a tendency to post with unseemly haste to commercial publication--these are the pitfalls awaiting users of today's quite excellent composition research.

With these introductory points in mind, let me begin by examining, in a necessarily brief and superficial way, the main outlines of this research, which is the base from which I have abstracted the taxonomy of compositional competencies.

The Research Base

Another problem with research on writing is that there is so much of it. What are its limits? How can we sort it out and keep it all in proportion? Faced with diversity, one does what the mind always does: invent superordinate organizing categories. I have invented six. One or two may seem to stretch somewhat the conventional notion of research. Nonetheless, I have found them extremely useful in processing--and I must say evaluating--the great amount of information one needs to keep in mind in integrating a reasonably complete and balanced view of compositional competence.

Category One: Discourse Structure

Some researchers prefer the term rhetorical theory. Studies of rhetoric and discourse structure begin, of course, with Plato and Aristotle. Researchers take as their object of study any text they find interesting. Their method is analytical and the linguistic level suprasentential, though sentences and words are the basic units. Some researchers try to locate pieces of discourse in relation to the points of the rhetorical triangle--speaker (ethos), audience (pathos), or subject (logos). Some categorize whole discourses according to their semantic purport or dominant purpose. Others concentrate upon identifying and classifying types of "connections" within discourses. Still others work primarily on paragraphs and sentences.

At the whole-discourse level, contemporary thinking has been enriched by the rhetorical theories of Kinneavy (1971) and D'Angelo (1975), along with the work, developmental in purport, of Moffett (1968) and Britton (1970, 1975). Becker (1965) and Braddock (1974) stand out for their contributions to paragraph study. Winterowd (1975) has described the main types of logical connections among sentences. Christensen (1967) contributed signally to our understanding of the relationship between syntax and style in the sentences and paragraphs of mature prose, and Pitkin (1977) is developing a nomenclature for characterizing the semantic functions of discourse constituents both within and across the boundaries of orthographic sentences. N. Chomsky (1965) and his followers, as is well known, have characterized, in generative fashion, the phonetic and syntactic structures of the sentence system invariantly acquired by all who possess language. Fillmore (1968) and the generative semanticists are describing the primary semantic functions within elementary predications. Searle (1969) and the speech act theorists are studying presuppositions, implicatures, performatives, and other constraints on communicative performance. Taken as a whole--and we ought more often to think of investigations at the several linguistic levels as being of a piece--this research characterizes the knowledge of grammatical, lexical, and semantic structures (most of it tacit, much of it still to be acquired by students of grade-school age, and some of it needing to be overtly taught) that persons bring to bear in the production of written discourse.

Category Two: Developmental Research

A few researchers have sought to depict the sequence of developmental stages traversed chronologically and in regular order by young writers en route to acquisition of mature discourse competence. A stage-sequence model of this sort might parallel in form the theories of Jean Piaget in logical thought, Erik Erikson in personality growth, or Lawrence Kohlberg in moral development.

Most noteworthy to date is the work of James Moffett in the United States and James Britton in England. Both begin by elaborating a view of the whole spectrum of written discourse and then speculate how the developing child progresses toward mastery of its parts. Moffett (1968) postulates the dimensions of abstractive altitude and rhetorical distance. Development consists of movement up the abstractive scale, from dramatic recording to narrative telling to expository generalizing to tautologic theorizing; at the same time, the learner progresses outward on the rhetorical scale, from contemplation to conversation to correspondence to public writing. Britton (1970) discerns two roles a person may assume in using language--that of spectator and that of participant--along with two functions to which language may be put--the transactional and the poetic. Underlying and developmentally anterior to the differentiation of both role and function is expressive language, which is a kind of phatic base (Britton does not use that word) initially manifest in children's speech but never wholly discarded by the maturing person. Out of expressive language, in some manner, emerges knowledge of the controlling organizational properties of transactional writing and the controlling aesthetic features of poetic writing.

Rather disappointingly, however, empirical confirmation of Moffett's and Britton's speculations has been slow in coming. Apart from plentiful examples of expressive intrusions and egocentrism in juvenile writing, no one has yet been lucky enough to stumble across--or clever enough to procure, or discerning enough to recognize--writing samples clearly reflecting in-progress stage-sequence acquisition of given discourse structures on the part of the writer--evidence, for example, that at Time 1, A has been acquired but not B and C; that at Time 2, A and B appear but not C; and that at Time 3, A, B, and C are all present in the writer's repertoire.

We do, of course, have developmental research on the acquisition of syntax and vocabulary. Brown, Cazden, and Bellugi (1969), C. Chomsky (1969), and others have charted the initial acquisition of grammatical structures. Studies of vocabulary growth and word fluency abound. Hunt's (1965) T-unit research and Loban's (1976) examinations of the same thing called by the name communication unit give us statistical information about changes in the intrasentential deployment of syntactic structures across the 12 years of school. But we have little or nothing in the way of actual empirical knowledge about the development of discourse competence.

On the other hand, since we know that children in the upper elementary and early secondary grades, when sufficiently motivated, can in their speech produce fragments of surprisingly mature arguments and explanations, and since we regularly require children to read or listen to passages embodying discourse structures in all forms, we must conclude that discourse competence is acquired prior to the time in school when we typically assign very much expository composition. Failures to manifest it in writing are the result of two factors: (a) physical and psychological demands peculiar to the writing act which children learn to meet only with further maturation and specific instruction and experience in writing; and (b) the fact that the vocabulary of transitional and connective locutions required in the writing of extended discourse does not become active until the secondary school years. This view accounts for our inability to turn up empirical evidence supporting the developmental aspect of Moffett's and Britton's work, since we ought to be looking for such evidence not in the writing of secondary-school youngsters but rather in the talk of elementary-grade children.

Category Three: The Composing Process

In the present decade a number of research pieces have appeared utilizing case study methods to scrutinize, as if in stop-action photography, the overt behaviors of students engaged in the activity of composing. The research of Emig (1971) was the first to capture attention, followed by that of Stallard (1974), Graves (1975), Mischel (1974), and others. Linguists and other psychologists at first questioned the point of the inquiries, since they deal with behaviors far removed from the mentalistic plane, or the "thought inside" of language acts, where theories are grounded. But educators immediately drew from them rich insights for the classroom. Seeing the composing process segmented into pre-writing, specific planning, transcribing, and reformulating, teachers found themselves inventing all manner of intervention activities as aids to student writers at each stage of the process. Oral composing, frequent stopping to reflect upon and contemplate what one has written, extended pre-writing jottings, slowing down, keeping consciously in mind the purpose of one's writing, and other behaviors and habits that could be drawn to students' attention were recognized as desiderata. Our conventional assumptions about the amount of time required for writing were overturned, especially in the case of impromptu writing assigned in class.

Moreover--although the point should hardly have needed empirical confirmation--research on composing provided evidence that the extent to which writing is self-sponsored rather than teacher-required and spectator rather than participant governs the extent to which student writers will undertake and persevere in productive composing behaviors. All in all, the least one can say about research on the composing process is that it merely points up what good writers have always learned to do on their own. The most to be said is that it has given writing teachers everywhere a whole new set of handles for teaching, along with renewed zeal and optimism. Given the choice, why not say the most? Notice, too, that some researchers on the composing process are joining forces with neurophysiologists in what has come to be called left brain/right brain research, thus playing out yet another chapter of the longstanding controversy between mentalism and empiricism, between attempts to construct models of the mind and efforts to map empirically the structure of the brain.

Category Four: Calisthenic Practice

One cannot overlook the substantial body of research on various practice activities other than actual writing which are said to develop or enhance writing ability. Several things come immediately to mind: oral language use, essay analysis, stylistic imitation, grammatical drillwork, and sentence-combining practice. Teachers in England have believably popularized the argument that oracy promotes literacy, while individuals on both sides of the Atlantic have experimented with role-playing, improvisations, focused small-group discussion, and narrative talk as activities conducive to the nurturing of writing skill. No one really knows the value of analyzing model essays or writing short exercises requiring close stylistic imitation; having stood the test of time, however, these activities doubtless will remain in use.

Turn now to grammar study. The most widely quoted sentence in all writing research pertains to grammar. It appears in Research in Written Composition (Braddock, Lloyd-Jones, & Schoer, 1963): "The teaching of formal grammar has a negligible or, because it usually displaces some instruction and practice in actual composition, even a harmful effect on the improvement of writing." (p. 37) Popular as it has been, the sentence is two parts false and only one part true. Insofar as it pertains to the involvement of overtly stated grammatical principles in right/wrong drillwork aimed at changing usage or dialect, it is exactly on target. But insofar as it pertains to the nomenclature for labeling surface structures of written sentences and to the display of these structures arrayed in certain stylistically notable sentence patterns, it maligns a method of teaching that has worked for millions of students and thousands of teachers throughout the history of education. To paraphrase T. S. Eliot's Sweeney, "I gotta use words when I talk to you about your words"--and grammatical terms and diagrams are the words and graphic devices invented for just that purpose.

Moreover, the sentence is flatly wrong in its "harmful effect" contention. This fact has most recently been demonstrated by a 3-year longitudinal study of the role of grammar in the secondary English curriculum, a study conducted in New Zealand and reported in America (Elley, Barnum, Lamb, & Wyllie, 1976). Two groups of students studied grammar; a third group studied no grammar but was given extra reading and writing. Not one of the 102 comparisons on a variety of test factors over the 3-year period (including analyses of student compositions) favored the no-grammar-but-extra-writing group. Elsewhere I have pointed out that a pervasive error orientation in grammar teaching will have an inhibiting effect on student writing. But the New Zealand study constitutes powerful research evidence disproving the contention that merely by displacing extra writing practice, grammar teaching exerts a harmful effect on the improvement of writing. It is just not so. Teachers who believe in the efficacy of teaching students to recognize and identify the forms and functions of sentential surface structures may do so in confidence and good conscience so long as they keep grammar in balance with other aspects of composition teaching and avoid undue emphasis on error.

One of the newest forms of calisthenic activity is sentence-combining practice. My own research (Mellon, 1969) and that of O'Hare (1973) and a number of others, coupled with the success of Strong's (1973) textbook, unmistakably confirm the claim that sentence-combining practice *does* enhance syntactic fluency--the ability to craft increasingly diversified sentence structures. My research used a technical cuing system; the vogue at present is for "apparatus free" exercises. It is often wrongly stated that sentence-combining practice merely requires writers to subordinate what they would otherwise coordinate or write in separate sentences. Not so. It helps young writers learn to see more and say more than they otherwise would, just as mature writers have learned to do. What occurs is primarily a cognitive act and only secondarily the exercise of grammatical options. Whenever one uses language, the essential process carrying the elementary predications of thought into the surface structure of mature speech and writing is that of sentence combining. More important even than aptness of vocabulary, it is *the* basic expressive fluency.

Nor is sentence combining always an option, even if we assume a plenitude of ideational content in the writer's intention, since semantic constraints governing the grammatically hierarchical arrangement of that content require that much of it occur as subordinate inclusions within the boundaries of orthographic sentences. If it is cast instead in the form of separate orthographic sentences, the discourse becomes a botch both ideationally and aesthetically. There is much more to sentence combining than persons imagine who see it only as icing on the linguistic cake. By the same token, however, sentence combining is not a rhetoric unto itself. We would do well to nip in the bud efforts to pass it off as a comprehensive approach to the teaching of writing, just as we should laugh out of existence current attempts to hang the label "sentence combining" on what are for the most part conventional composition programs.

Category Five: Evaluative Description and Scoring

Like anything else taught in school, writing must be descriptively evaluated in the course of testing students for purposes such as assigning letter grades, prescribing further study, and deciding college admissions. Teachers call the process grading or marking (the latter a far better term); commercial testers call it scoring. Diederich (1974) and his colleagues at the Educational Testing Service have been particularly helpful to writing researchers and large-scale testers through their identification of factors in the judgment of writing ability and their development of techniques for rapid reading and holistic scoring of essays. The latter are quite useful in rank-ordering students and establishing measures of central tendency in samples of writing whose quality levels serve as dependent variables in composition research.

More recently, however, as a result of issues raised in the writing assessment conducted by the National Assessment of Educational Progress (a project aimed at assessing conditions of knowledge generally possessed by groups of people rather than testing the learning levels of individual students), we now realize how vacuous are holistic scalar scores with respect to specific rhetorical features of writing. More importantly, through fuller elaboration of measurement objectives (for example, those of the second-round Writing Assessment) and careful integration of topic with scoring rubric, we now understand how it is possible to gain richly detailed information not only on the primary rhetorical trait of a piece of writing, as governed by its topic, but on secondary traits extending to all aspects of the piece. My own study of National Assessment has contributed modestly in this regard, but principal credit goes to Rexford Brown of the Assessment staff and in particular to Richard Lloyd-Jones and Carl Klaus (National Assessment of Educational Progress, 1976), who developed the primary trait concept. Primary trait has positive implications for teaching as well as testing, in individual classrooms and local settings as well as nationally.

Category Six: Idiosyncratic Textbooks

It perhaps seems strange to regard textbooks on writing as pieces of research. And in the usual case of texts from publisher A that merely imitate the texts from publisher B that ape the texts from publisher C, this is surely true. On the other hand, there do appear on the market, from time to time, truly original texts, idiosyncratic texts--texts whose authors clearly have a unique slant on the writing process. Insofar as these special slants alter our own perceptions, they obviously further extend and elaborate our total view of composition learning. In this very important sense they count as research, just as much as do the most empirically rigorous clinical experiments. I have in mind texts such as the following, listed in no particular order:

Writing without Teachers by Peter Elbow (Oxford University Press)

Writing for the Fun of It by Robert and Isabel Hawley (Education Research Associates Press)

A Writer Teaches Writing by Donald Murray (Houghton Mifflin)

On Writing Well by William Zinsser (Harper and Row)

Telling Writing by Ken Macrorie (Hayden Book)

English through Poetry Writing by Brian Powell (F. E. Peacock)

Growth through English by John Dixon (Oxford University Press)

Stop, Look, and Write! by Hart Day Leavitt and David Sohn (Bantam)

English for Maturity by David Holbrook (Cambridge University Press)

Sentence Combining by William Strong (Random House)

A Student-Centered Language Arts Curriculum, K-13 by James Moffett (Houghton Mifflin)

Topics in English by Geoffrey Summerfield (B. T. Batsford)

Language in Thought and Action by S. I. Hayakawa (Harcourt Brace Jovanovich)

Sense and Sensitivity by Patrick Creber (University of London Press)

Wishes, Lies, and Dreams by Kenneth Koch (Vintage)

Classical Rhetoric for the Modern Student by Edward Corbett (Oxford University Press)

Obviously space does not permit me to comment on these textbooks, some of which are new, some old. From each I learned something I had not thought about before that writers ought to know and therefore also teachers of writing. Persons who have read these books know what I mean. To others, I heartily recommend them as research worthy of the name.

The Taxonomy

In developing the following taxonomy of compositional competencies, I have, of course, drawn upon more than the various lines of research just alluded to. I have relied upon common sense and have sought the counsel of writing teachers to whom the researchers' names in the foregoing paragraphs are largely unknown. I have imagined a number of so-called psychological competencies whose grounding is hypothetical rather than empirical. I admit to the inclusion of some fairly stodgy assumptions about the necessity for hard work and perseverance by students in the face of awareness that the activities of schooling are essentially artificial activities--warm-ups, practices, rehearsals, dummy runs--much as we may try to make them otherwise.

The taxonomy does not separately categorize basic linguistic competence--that is, the tacit knowledge of grammar (phonetics, syntax, and elemental semantics) and the lexical feature system that all persons acquire (with minor exceptions) during their preschool years. Instead, the components of this knowledge appear in various places in the taxonomy. Transformational relations, for example, are the substance of syntactic fluency, and the semantic relations of elemental statements ("basic sentences") constitute the building blocks of discourse competence. Knowledge of orthographic rules is analogous to phonetic knowledge, since the two are counterpart variants representing the surface structure of language. The reason I have scattered the components of grammar in this fashion is to de-reify in our minds the transformational linguist's familiar three-part model for describing the deep-to-surface structural relations in sentences. Thus I hope to lead composition teachers to recognize what a few discourse analysts are on the verge of acknowledging--namely, that the orthographic sentence (equivalently, the T-unit or independent clause) is a grammatical artifact only, whose role in the semantic structuration of discourse is vacuous and accidental, much like that of the phoneme in distinctive-feature phonology. In short, "going beyond the sentence" might never have become such a stumbling block in contemporary discourse studies had it not been for our fixation on transformational grammatical models.

But enough comment. Here, finally, is the taxonomy of compositional competencies, organized in five general categories:

I. Lexical and Sentential Competencies

A. Vocabulary content: One cannot write without words. Everyone has a basic vocabulary, but it is in extending beyond the basic that students begin to acquire what we might agree to consider true "vocabulary competence." The words we know, to a very large degree, are a direct measure of the knowledge we possess, structured in mind in an intricate conceptual web. The greater the content of a writer's vocabulary, the more he knows and the more he has potentially to say. Putting it slightly more generally, there is a sense in which knowledge, as represented in the words we know, is our most important compositional competency.

B. Vocabulary fluency: The ability to call forth readily out of one's vocabulary just the right words for each basic statement one chooses to make. "Rightness" is judged according to considerations of primary meaning and connotation as well as tonal concordance with the surrounding context. Basic statements are the elementary sentential propositions ("basic sentences") whose structures abstractly underlie the orthographic surface of text. It is by their agency that pure thought is represented verbally.

C. Syntactic fluency: The ability to deploy within each full sentence that one constructs all the basic statements that arise in mind and are deemed appropriate for inclusion by grammatical subordination. Possessing syntactic fluency means that, by use of syntactic processes known as coordination and embedding, the writer is readily able to combine within the surface structure boundaries of individual sentences, in forms whose predications may be finite (clauses), non-finite (verbal phrases and conjoined elements), or wholly deleted (modifiers and compounds) as many elementary statements as arise from thought and recommend themselves for grammatical subordination within these sentence boundaries. It also means that the writer is able to render such combinations in ways that are stylistically concordant from sentence to sentence in the same piece of discourse.

II. Discourse Competencies

A. Recognition that the structure of meaning is integrative and hierarchical: The ability to understand a group of words that mean different things taken separately as one thing when read in a sentence. Similarly, the ability to understand a group of sentences meaning separate things when read apart from one another as meaning one thing when read in a passage of connected discourse. Put somewhat more technically, the ability to recognize that language represents thought hierarchically, and that any unit of language--from the individual word up through elementary and surface-structure sentences to supra-sentential discourse chunks and ultimately whole discourses (which may range in length from a single orthographic sentence to many thousands of sentences)--is both a whole consisting of and defined by its parts and at the same time an (actual or potential) part of another larger whole. When viewed as a whole, any unit of language means whatever the sum of the semantic relations of its parts makes it mean; when viewed as a part of some larger whole, it performs a semantically identifiable function in establishing the meaning of the larger whole.

B. Recognition of logico-semantic relations: The ability to understand how words fit together to make meaning, and to recognize the many semantic connections that unite elementary statements into larger units of idea. Put more technically, the ability to comprehend and produce the full range of logical and semantic relations which endow any temporally linear sequence of words and sentences with a hierarchical structure representative of their thought. Through the agency of these logico-semantic relations, the meanings of separate words are arranged into elementary statements and their contextual reference established. The amalgamated meanings of each basic statement are then hierarchically compiled, through the further agency of these logico-semantic relations, on the one hand formally (i.e., syntactically) into the surface structures of orthographic sentences, and on the other hand ideationally into supra-sentential discourse chunks for which we lack an exhaustive nomenclature. These logico-semantic relations operate at three levels, as follows:

1. Elementary statements: intra-propositional (word-to-word) relations established by the syntax of "basic sentences."
    a. Relations of case category, such as: agent, instrument, object, recipient, source, path, goal, manner, place, time, duration.
    b. Relations of attribution, such as: traits, qualities, features, aspects, physical properties, appurtenances, ownership.
    c. Relations of modality, such as: tense (past or present), voice (active or passive), affirmation (positive or negative), verbal aspect (progressive or perfected), mood (e.g., future, conditional, emphatic), and purpose (e.g., declaring, commanding, requesting, querying, promising).
    d. Relations of implication, such as presuppositions, entailments, analyticity, falsity.
2. Inter-sentential conjunctive relations, such as: coordinate (and), disjunctive (or), adversative (but), causal (because), purposive (in order that), conditional (if), concessive (although), comparative (more, less, same), or temporal (when). Relations of conjunction may cross over or remain within the boundaries of surface-structure sentences.
3. Supra-sentential relations among hierarchically

structured discourse chunks, such as: temporal sequences, step-by-step process sequences, ordinal sequences arranged according to an endless variety of ordering criteria, geometric and spatial configurations, cause/effect sequences, reason/purpose sequences, same/different assertions (comparison and contrast), class/subclass inclusions and exclusions (definition and classification), truth assertions and inferences stemming illatively from the premise-and-conclusion system of syllogistic logic, hypothetical and suppositional assertions, assertions of value and worth, assertions of affective status and emotive level, and many more.

C. Recognition of organizational unity as governed by dominant purpose: The ability to plan and organize whole discourses (e.g., notes, comments, letters, themes, papers, articles, and treatises) that are unified by a single dominant transactional purpose, and display a primary rhetorical trait.

1. Informational writing: One broad category of transactional writing is informational in purpose in that the whole piece of discourse may seek, for example, to record, report, characterize, define, analyze, classify, compare, distinguish, reason logically to conclusions, explain, exemplify, analogize, generalize, or theorize.

2. Conative writing: A second category of transactional writing is conative in purpose in that the entire piece may seek to instruct, recommend, demand, legislate, regulate, judge, advocate, argue, or persuade.

(Note: Two kinds of non-transactional writing also exist. Opposite to transactional (expository) writing is literary writing, whose subject matter is imaginative and fictive, whose mode is narrative or dramatic or lyric, and whose aesthetic features may be poetic. Between the two is expressive writing, which tends to be unstable as to purpose and form, unstructured, and most immediately reflective of the continuously variable state of human intention. The distinctions and terminology used here are those of James Britton.)

D. Recognition that intention may be expressed implicitly as well as explicitly: The ability to convey intention implicitly rather than solely by literal statement, by use of devices such as metaphor and other forms of imagery, tone and mood, rhythms and balances, irony, sarcasm, innuendo, anger, humor, flattery, and mockery.

III. Psychological Competencies

A. The ability to discover (invent in one's mind or collect from external sources, including the minds of other people) telling ideas that serve both as a stimulus to one's own further thought and as the direct content of one's writing.

B. The ability to cast these ideas creatively--that is, to arrange, manipulate, and ultimately verbalize these ideational elements in ways that match dissimilars, that are novel and unexpected, that are perceived as simultaneously spontaneous and apt, and that to an appreciable extent prove effective and memorable.

C. The ability to think bi-channelly--necessary if one is to be able to inscribe what is being written at the moment while simultaneously storing in memory what has arisen in verbal consciousness but is yet to be written, thereby avoiding the "I can't write as fast as I'm thinking the words" problem.

D. The ability to prevent, control, or overcome writing apprehension, and to forestall or master "blank page" aphasia.

IV. Competence in Conforming to "The Rules of the Writing Game"

There are two ways in which writing may be considered a game-like artifice. One way pertains to the essential difference between writing and speech. Speech is naturally learned and (except when we are not quite certain about what we are saying) spontaneously performed. Writing, however, utilizes a somewhat different vocabulary and consists of extended and deeply hierarchical structures in which relations of parts to wholes must be signaled by explicit verbal devices. These matters have to be overtly learned and consciously attended to in the crafting of written language.

The second way pertains to writing done in schools, wherein the writer, to be accounted successful, must learn to maintain certain pretenses--chiefly, that topics are self-initiated when in reality they are teacher-imposed, and that one's audience is an undifferentiated adult public when in reality it is just one's teacher or, at best, one's teacher and a few classmates. In recent years many educators have sought to eliminate the need for these pretenses by devising ways to make the purpose and audience of school writing seem "for real." But no matter how it may be made to seem, it almost never really is real. Thus it seems preferable to acknowledge to students the game-like quality of school writing and to proceed directly towards finding ways of helping them assume the pretenses required.

A. Knowing how to introduce a topic (hence, begin an essay) as if the ideas expressed were put forward on the writer's own initiative rather than in response to an externally imposed topic question.

B. Knowing how to employ the many transitional/referential locutions essentially unique to writing, whose function is to "signpost" or otherwise tag and render verbally explicit the ideational structure of any piece of discourse.

C. Knowing how to draw to a close any piece of writing by means of the many appropriate strategies the written language uses to signal endings and conclusions.

D. Knowing which words of the spoken language (especially coterie slang, conversational and juvenile locutions, and expressive intrusions of other sorts) are barred from the formal registers of transactional writing, unless used intentionally for effect.

E. Knowing how to achieve a particular writing style or styles, largely through tonal concordances in vocabulary choice and rhythmic repetitions of syntactic structures and idea patterns, and knowing when to shift styles.

F. Knowing how to recognize and meet the informational needs of a general and undifferentiated reading audience as distinct from those of a known correspondent or one or more auditors present in a speech situation.

G. Knowing how to conform to the mechanical conventions of orthography (e.g., spelling, punctuation, capitalization, syntactic form, and manuscript form).

V. Habit Structures and Self-Governance

A. Pre-writing: The habit of devoting sufficient time and effort (as measured by the success of the final product) to the discovery (collection and invention) of content, and to thought and planning about its appropriate organization.

B. Decenteredness: The ability to maintain all parts of a piece of writing under the control of a unified purpose, and to continually monitor and edit one's writing with an eye to its specific reading audience.

C. Reflectiveness: The habit of rehearsing elements of one's sentences repeatedly in mind prior to their inscription, and of stopping frequently to re-read and contemplate what one has written to that point.

D. Effort and staying power: The willingness to engage in the hard, trying, and demanding work of composing written discourse, and to persevere until the final proofreading.

E. Criticism and revision: The willingness to accept tutelary criticism, and often to revise or discard and recompose writing already "completed."

F. Risk-taking: The willingness to try out new structures and modes of expression as a necessary step in their mastery.

VI. Accidental Problems Requiring Special Instruction or Therapy

A. First-language intrusions, where English is a second language.

B. Spoken-dialect intrusions, where Formal or Standard American Written English is the accepted objective of instruction.

C. Spelling dyslexia, and other biological (brain damage) dysfunctions.

Decisions about Teaching

In reviewing the above taxonomy, I am well aware that many teachers will say, "But it's so abstract! My students

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couldn't begin to comprehend material like that." To which I answer: It is abstract, for the simple reason that the structure of written discourse, of language, of learning--indeed, the structure of anything--is by its very nature abstract. The processes of linguistic production/comprehension, though non-conscious, are abstractive processes. To understand that language makes meaning hierarchically rather than in a beads-on-a-string linear manner is to require that the teacher of language (whether reading or writing) be able to recognize this hierarchical structure and speak about it comprehensibly in the course of explicating pieces of writing, whether of the students' own or published pieces, or whatever. Failing this ability, teachers are limited to a pedagogy that amounts to little more than fussing with orthography.

As to students comprehending the material of the taxonomy, we must remember that comprehension occurs in many forms. Discourse competence, like grammatical competence, is tacitly acquired as a result of experiences in language use. Teaching about the structure of discourse consists mainly of calling students' attention to this or that structural feature of a passage, pointing out, commenting, asking what the consequences would be had some other form been used, and so on--making use of such technical nomenclature as may be required without allowing the nomenclature to dominate the teaching. Lexical and syntatic fluency--and also, perhaps, creativity--may be developed by calisthenic practices. The "rules of the writing game" are, by the high school years, straightforwardly teachable. High apprehensions may be identified and dealt with through individual counseling. The desirability of certain composing behaviors may be explained and their habituation nurtured. In short, everything contemplated by the taxonomy can realistically be incorporated in programs of classroom instruction.

Eight Recommendations

In my view, the teaching of expository composition (transactional writing) should not begin until the secondary grades. Two prerequisites must be established. One concerns prior writing activities, the other the "gentling" of children. All manner of expressive writing and writing in the spectator role should be encouraged during the upper elementary grades and during the middle school years as counterpoint to the transactional--journal writing, memory writing, the recording of sensory impressions, and personal narratives. These activities are nonthreatening and often fun; they tend to block the development of apprehensiveness and they often lead to rewarding forays into literary writing, familiarly referred to as creative. By "gentling" I simply mean calming the anxieties of children, integrating and interpersonally acquainting them in classroom groups, and trying to provide during the school hours some of the social structure they miss on the outside owing to the breakdown of families, the lack of parenting, too many hours before the TV, and too many meals in fast-food restaurants. On this point, I am surprised but pleased to hear teachers report that the main payoff of the small-group activities comprising James Moffett's "Interaction" materials is not composition per se but just the sort of socialization I am describing. Without this gentling, nothing can be taught or learned but frustration.

Now let me present eight recommendations I believe teachers and curriculum coordinators would do well to consider in planning their instructional programs.

1. *Wide reading and vocabulary learning*. Neither of these activities falls within the province of composition teaching, yet both are essential to the development of writing ability. Vocabulary learning should be the objective of every subject in the curriculum, but the responsibility is usually passed to the English teacher. Wide reading (as distinct from close analysis of selected texts) can often be so seductive that the hard work of composition teaching gets lost in the shuffle, as happened in many schools that substituted elective programs for the traditional English syllabus. The issue is as old as the English curriculum, but I prefer at present to separate composition teaching from literature and media study. In that way one can tell at a glance whether either is receiving short shrift.

2. *Assignment sequences*. Teachers (or curriculum specialists or commercial houses) should develop full-year or full-course sequences of weekly (or more frequent) writing assignments printed in loose-leaf format for manufacture in class lots and distribution one by one to students. Early in the year and in the junior high grades, as noted, the assignments would call for writing which is expressive in purpose and spectator in role. The assignments should range across all types of informational and conative writing and cover a wide variety of topics. The assignments themselves, rather than rhetorical principles or paragraph types, would provide the organizing structure of each year's course of study. Research is needed on the question of optimally *sequencing* assignments leading to the development of competence in the various modes of discourse.

3. *Pre-writing worksheets*. Als developed for use with each assignment would be separately printed pre-writing worksheets. These would call for *discovery* activities, some to be carried on outside of school, some in small groups in the classroom, and some alone--perhaps after consulting source materials. While they would concentrate mainly on the discovery of content, pre-writing worksheets would also contain items requiring students to think about (and jot down notes on) such things as organization, audience, and beginnings and endings.

4. *Booklets of model writing*. In composition, imitation is an effective mode of learning. Imitation, of course, is really a cover term for the host of cognitive processes that come into play when one attempts to model one piece of discourse on another; it is by no means the simple activity we commonly think it. But it is effective. Secondary schools need to borrow a method from college teaching and make greater use of models providing students with examples of the kind of discourse a given assignment requests. The pitfall to avoid is pitching the models too far above students' heads--as usually happens in college readers. Instead, teachers (or again, whoever is developing the materials) should commission a number of exemplary essays to be written, on a contest or contract basis, in response to some of the actual assignments included in each assignment sequence, by older students or nonprofessional adult writers. These models would be printed in booklets and perhaps followed by questions guiding the study of their structure and content. Most important, students would perceive this writing as being within shooting distance, as pieces they can actually emulate. Otherwise, for most eleventh graders, excerpts from Joan Didion and Garry Wills, for example, are for practical purposes as unreachable as the third act of *Hamlet* or Milton's *Areopagitica*.

5. *Instructional manuals for peer readership and peer response*. The two main problems blocking effective composition teaching are that teachers cannot possibly mark 75 to 150 essays each week and that students write for a readership of one--the teacher. Thus we must arrange matters so that students write for one another as well, and respond to and mark each other's writing (excluding summative evaluation and final grading). We may do this confident in the certainty that they will learn a great deal about their own writing in the bargain. Instructional manuals for this purpose would begin by laying down procedures for the classroom organization of peer readership groups. The basic teaching device thereafter would be sample essays accompanied by exemplary markings and commentary. Natural-

ly, the marking of mechanical errors would be covered, but the *main thrust* of these manuals would be to illustrate critical commentary on broader aspects of discourse (e.g., idea sequences, organization, logic, style, argumentative and persuasive effectiveness, and unity).

6. *Writing checklists*. Accompanying the instructional manuals would be a single-sheet writing checklist which would serve as a reminder of the categories of response students should consider in peer marking. These would be produced in pads and provided one per student. College composition programs frequently use this device; secondary schools ought to.

7. *Sentence-combining practice*. Regardless of the composition program in use, studies now in hand, that are available for everyone to read and judge and have nothing *whatever* to do with the study of grammatical concepts or nomenclature, indicate with a degree of clarity and force seldom encountered in educational research that *every student from Grade 7 through Grade 12 should spend about 10 or 12 minutes of every school day* writing out and checking two or three sentence-combining problems. Multi-level sequences containing a total of about 500 sentence-combining problems each should be developed for each grade, manufactured in kit form for individual student use.

8. *"Special teacher" status for persons trained in the diagnosis of compositional dysfunctions*. We are learning enough about the psychological competencies underlying writing, as well as about the importance of certain kinds of composing behaviors and the identification of specific disabilities, to justify the creation of "special teacher" positions for individuals, credentialed by appropriate graduate study, who would operate diagnostic and special treatment facilities in schools. The need in this area is clear and present, and its potential is wholly untapped.

Conclusion

This paper began by discussing composition research and continued by setting forth a taxonomy of compositional competencies; it concludes by speaking about teaching. I hope that readers have found the progression natural and illuminating. For the future, I hope that interposing a taxonomy of learning between research and practice will keep our teaching responsive to individual lines of research as they appear, without allowing it to lose balance and proportion with respect to everything else we know about compositional learning--and to the immense amount we still do not know, for which we rely on the mysterie of craft.

To conclude, I wish only to warn against the kind of advice that journalists and professional intellectuals so often give composition teachers whenever word of a "literacy crisis" gets abroad in the land. With glowing references, for example, to Jacques Barzun, Edwin Newman, and the Strunk and White stylebook, these persons admonish writers and writing teachers as follows: (a) strive for clarity of expression and precision in word choice, (b) write simply, in short declarative sentences, and (c) know what you want to say before starting to write. However suitable for adults who have acquired compositional competence, these admonitions are misleading in the classroom.

Item (a) for instance, will be construed as sanctioning the worst kind of comma-hounding, mechanical nitpicking, and lexical conservatism. Instead, we should encourage students to take risks and to make errors; to write endless imitations (thinking them, as Dylan Thomas said, colossally original, like eggs laid by tigers); and to experiment at all forms of written expression, whether or not they manage them well at first. Item (b) results from naiveté about the formal ingredients of simplicity in style. We know that the independent clauses of mature expository prose are half again as long as those twelfth graders write. They seem simple only because accomplished writers have learned to cast much of the content included within orthographic sentence boundaries in the form of free modifiers--predominantly reduced clauses--that either interrupt the structure of the base clause or cumulate coordinately before or after it. But as Moffett (1968) has observed, children's sentences must grow rank before they can be trimmed. Sentence-combining practice fosters this growth by developing the extremely complex skills underlying seemingly simple expression. To attempt to teach simplicity directly is to misunderstand the course that learning must follow. As to item (c), it is a great mistake to tell students that in writing we merely transcribe what we already know about a topic. The processes of verbal thought are constructive processes, and the overall meanings of discourses are greater than the sums of their parts. We base our thinking upon prior knowledge, to be sure, but in the process of composing and inscribing emergent thought we are actually creating new knowledge not previously possessed. This is why one often hears it said that writing is thinking, or that a person can't know what he thinks about a topic until after he has written about it.

I do not mean, of course, that we should overlook the importance to one's own thought of ideas drawn from external sources. This is particularly true in school writing, where topics are ordinarily imposed rather than self-sponsored, and where students' initial responses are often that they know little or nothing about a given subject and thus have nothing to say about it. For this reason, the *collection* of ideas from the minds of others is often much more productive of subsequent thought than are attempts to coax invention directly. Obviously we do not want student writers plagiarizing or merely copying sections of composed discourse, but we do want them to "appropriate" elementary ideas whenever and wherever they can.

Finally, as to feelings about the writing act itself, we must remember that there is nothing more exhilarating to the mind than the flash of creativity and invention accompanying the birth of words, whether the ideas those words convey are wholly new or those we have merely enlisted for our own rhetorical ends. It is to this and to the pleasure one takes in the knowledge of a task well performed and in beholding a product well crafted and a self well represented that we must direct young people seeking to know the motives for writing.

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SOURCES OF KNOWLEDGE ABOUT LITERACY

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Rarely have I been so frustrated by composing as I have been in trying to write this paper. I have started several versions; in each I would grind out a few paragraphs or pages and then my powers of invention would fail. Outlines refused to be fleshed out; notes refused to coalesce. Finally, however, I found the word in the assignment that was giving me so much trouble. So long as I was directed to deal with "instructional theories of writing" I was comfortable, but then I would come to "significant research findings" and the "implications of this research." To my imagination, the word research was so much smog. If I were to be useful, I first had to clear the air by considering the sources of knowledge about writing and composition.

I may, of course, be conjuring up an unfair image of "research." I may be limiting the term excessively. I think of research as controlled studies which are carefully designed and limited to produce information on very specific points. Social science. As a professor of English, I would never make such a study alone; I would immediately call in a statistician-designer to keep me on track, to provide the systems of control while I worried about writing and teaching. Years ago when we were preparing Research in Written Composition, Richard Braddock and I were a little gullible about all of the research machinery, but Lowell Schoer kept urging us to have confidence in the two and a half millennia of received knowledge. We were prepared to believe in science; he pointed out that over the centuries some folks have managed to transmit knowledge about writing, and other folks have found teachers useful. It was not the past which was on trial; instead, present researchers had to demonstrate that they really could offer useful knowledge.

One reason I was later glad to read Michael Polanyi on this point is that he confirms my prejudice as Schoer stimulated it. Polanyi writes in Personal Knowledge (1964): "Science is a system of beliefs to which we are committed. Such a system cannot be accounted for either from experience as seen within a different system, or by reason without any experience" (p. 170). He notes that science is a way of observing within a closed system of observations. The system itself is subject to revision as more observations are gathered, and it is deficient as a system until large bodies are gathered. "Research" in the area of literacy is highly tentative.

Still, let me illustrate my point with a current but tangential example. One of the fashionable topics at meetings of people who teach writing is the specialized functioning of the right and left brain. The right brain manages the artists among us, and the left brain runs the managers. I am being a little facetious; the neurologists probably are onto something big, and I wish them well. I recall my delight when as a student I first learned about those experiments with electrical stimulation of the brain in order to discover what part controlled what function. I thought that we would soon increase our control of the mind and be able to think greater ideas. And I could probably do a science fiction exercise with the current materials too.

You will note that the implications are not scientific but metaphoric. It is the literary--not the scientific--knowledge which is important here. When you get right down to points, we have known for centuries that some people were more artistic than others, and it does not matter much whether you blame it on the dominant side of the brain or on just being born a poet. From a literary view of neurology we can relearn what we have already known; treating everyone alike is to do injustice to almost everyone. Teaching strategies are at best approximations, and the more we standardize curricula, the more we merely approximate for any one student. We know that, but we need to be reminded so that we build in exception principles and counsel our teachers to be ready to adopt alternative strategies for the people who are different. The right-left brain fad becomes for us an exciting metaphor to revivify an ancient principle. It is not, for us, hard knowledge.

The power of the metaphors invented by allusion to science is augmented by borrowing the status accorded to science in our society. We know that a table of calculations is more persuasive than a reference to Aristotle even though Aristotle may have a more useful comprehensive view of our subject. As Conrad did not say, "Aristotle, he dead."

Aside from the general ethical proof which supports any doctrine clothed in the language of science, another force makes us seek research which appears scientific. The Received Learning is sometimes contradictory, or it is received out of context and thus is used to promote error. Consider the problems of people who read Aristotle on tragedy without recalling that Aristotle had before him a particular kind of stage tragedy. Also consider the preoccupation with the study of grammar, based, I suppose, on the admiration of the grammar school as a place of basic learning. So it was, but the grammar of the trivium in medieval learning included most of what we would call literature, and there was then more inclination to believe that the study of language as such was equivalent to the study of the essence of things. When we now talk of the study of grammar as basic and find all sorts of research studies designed to test the hypothesis, we have limited concepts. We test the trivial (in another sense) surface features of grammar; they were coping with epistemology. In short, scholarship in a traditional sense is still essential for raising questions about the nature of common practice and tacit knowledge.

Somewhere scholarship and research meet. Tacit knowledge and scholarly traditions and controlled testing should complement one another; each should correct the tendencies of the others to claim too much.

The describing and evaluating of writing illustrate the need for a fusion of methods. Through the centuries we have become quite adept at describing individual texts. For centuries we have talked of propositions, analysis, rhythms, tropes, and the rest. Sometimes the descriptions of a single piece of writing are longer than the original text, and several people have to criticize a particular work before a satisfactory description emerges. The evaluations often prove primarily to relate a text to the time and needs of the critic--to emphasize the values which are somewhat transitory although some values persist. A work which speaks beyond its own time is usually accorded greatness. Nonetheless, almost any good reader is a practical describer-critic even without the benefit of much theory, and much of the knowledge of what feature causes what effect remains tacit. The good reader often is unable to explain what is done. Still, on one work at a time, we are quite good.

The theorists have been with us in Western cultures at least since the Greeks worked at it. Even now, Plato and Aristotle for some people are almost sufficient for a study in rhetoric. Those of us willing to accept later contributions to the cause still must admit a long tradition of rational examinations of the theories of description and evaluation of discourse. Most researchers are sufficiently ignorant of our past that a course in classical rhetoric will tell them more news about writing than weeks and weeks of poring through current journals. Our standard textbooks are remarkably short in reporting what is already known about rhetoric and writing, so it is perhaps to be expected that so many studies begin with a weak basis in the knowledge to be tested.

Still, some modern problems cannot be solved by ancient one-at-a-time criticism. We are faced with students and writing en masse. Mass education has given us problems which cannot quite be answered merely by saying that all education must be individual and that mass procedures cheat everyone somewhat, and some people more. Our strategies for handling large numbers are based on the assumption that we are able to transform our skill in reading single papers into a skill for reading masses of papers.

Most of the advice about writing to be derived from current research depends ultimately upon our ability to relate some strategy of teaching to some significant and demonstrable changes in writing samples. That is why I have blocks about what we can be said to learn from research and about what our systems of description say about the accomplishments of teachers or schools. The limits of the research itself determine what is socially significant, and the researchers pretend to moral neutrality. Our descriptions are likely to be uninformative and ineptly defined; our evaluations, even when consistent enough to be called reliable, are either so limited as to be pointless or so crudely pragmatic as to be unsuited for research. Our limited skill in testing may be leading us to overvalue some features of writing just because we can test for them, and we lack a suitable theory of discourse to provide a context for proper evaluation. Other than that, I enjoy tests.

Consider the common techniques. A vocabulary test is a rough indication of verbal ability. It seems to be a necessary but not a sufficient ground for good writing. If it were sufficient, most college professors would write better. We might even admit that some journalists have vocabularies apparently so limited that they are never subtle and only rarely precise, and yet they still write clearly and are admired by the mass audience. Since we posit that words represent concepts, we are generally willing to grant that people with lots of words have lots of concepts, and such people will do well in discourse. Those assumptions may be adequate to justify using vocabulary tests for admission to graduate school or college because higher education in process provides ample opportunity to help bad but potentially good writers learn the craft or be detected and ousted. But by itself the vocabulary test neither describes nor evaluates writing or discourse.

The usage test also works indirectly to test a symptomatic feature of language. Mostly tests of usage are tests of social experience. The "right" answers are ordinarily the most conventional responses, those represented in frequency of appearance by the midsection of a normal curve. The extreme choices strike the ordinary person either as fussy or ignorant. Although college professors tend to be a little fussy, they still react well to conventionality (they may be said to invest their careers in the status quo in all respects except that of their own narrow specialty); thus, the student who scores well on usage tests probably does well in college. The test predicts success in school, not writing ability, although some people tend to equate good writing with conventional usage. A person who does not speak a prestige (or C-range) dialect will be considered ignorant and incapable of good writing even though some such speakers are clearly very powerful in speaking within their own dialect group.

These objective tests represent good compromises for admissions offices. They are relatively cheap, hard to argue with, and easily administered. The lack of apparent content disarms critics, and when the tests err, the rejected people have nothing much to point to. Since those who are accepted ordinarily make it to where they were going, why should they complain? Like bad doctors, we bury our mistakes. The tests have a pragmatic value in sorting out people even though we cannot be sure of what they prove about writing. Fortunately for the users, most people are satisfied and do not question the scores too closely. That may be sufficient for administration, but it is not good enough for research.

People who are serious about writing demand that we make tests of actual samples of discourse. The challenge is to report accurately on the quality of a sample of discourse with numbers as convenient as those obtained on objective tests. The objective tests have dozens of questions, lots of details for statistical examination. The usual manner of dealing with a sample of discourse produces one number--30 minutes to get one score, one bit of information subject to all sorts of error. Subscores--such as a count of the number of transitional adverbs used per 1,000 words--are hard to create and of doubtful significance.

The assumptions of the statistical research favor the objective test, yet the professional organizations in English strongly prefer direct discourse. They argue that no one feature of discourse is sufficient to define its quality, so the nicely limited and reliable examinations of simple features of discourse lack validity.

Then why not get writing samples? Even test samples are only tests, not real discourse subject to the pressures of exigent need. Furthermore, it is difficult to find topics which are within the range of experience of all the people to be tested without inappropriately favoring one group over another. Comparable conditions of testing are almost beyond stipulation, and the usual admonition that a test shows at least what one can do must be observed with double force. We all have bad days in writing; as I have found in writing, some topics prove especially resistant. Some people write better in the morning at a particular table in a particular room. Often the creative response requires eccentric stimuli. That is, objective tests work best under most test conditions because they demand conventional responses, the kind which are most likely to come to the surface under pressure. Writing--even technical writing--is a creative act, so the best responses in general come under mild self-induced attention, free of pressure. The pressure of the deadline works most effectively in forcing conventional prose--say, the journalist's formulaic report. And a half hour of ex tempore or ad lib writing may not be at all related to what might be produced after reflection and revision. Some of us write terrible first drafts. In short, getting a suitable sample of writing is reason enough to want to give up.

Fortunately in many situations it does not matter much. If one is writing a placement essay in freshman English, ordinarily one will have a second chance, if needed, and actual registration in a class is hardly a severe penalty for the error in the test. Usually early performances in the class still provide options for reassignment. Likewise the gross distinctions provided by advanced placement grading are likely to be adequate for gross awarding of credit, although no one is really sure what is being credited.

Scoring writing samples is another complication, and the Educational Testing Service (ETS) does as well as any. The procedural details of the standard ETS method of scoring papers gathered en masse need not concern us, but we should note that the calibration of the readers is experiential. The carefully selected scorers read sample papers together very rapidly and learn to react under direction in an agreed way. The consistency of the reactions is tested by pitting one reader against another, but rarely is much said about what is being reacted to. ETS has made studies--sophisticated ones--suggesting that different kinds of people define good writing in different ways, but despite variations it is possible to get reasonable consistency of scores, perhaps because some of the variables interact.

In the end, though, all that is left from the essay is a score on a scale of 1 to 4 or 8. That score can then be related to some particular detail in the writing or a method of teaching, and we can create an index of correlation. For example, we can count the number of simple sentences, complex sentences, and compound sentences. To be sure, we will find that because language is as complicated as it is, we do not get perfect reliability even on such a specific task; furthermore, given what we know about complexity in syntax as well as aptness in rhetoric, we will find a number of critics who will say that what we are looking for is not significant anyway. Whatever we discover, we then relate it to the somewhat imperfect score assigned to the writing itself; what we finally claim does not amount to much. We have described very little, and we still have not faced the issue of purpose as it affects both the motivation of the writer and the aptness of the writing.

At this point rhetoricians might ask for a model of discourse. They might hypothesize that sentences or words isolated from purpose are of no real interest. The structure of discourse depends upon purpose; the structure governs the quality of all secondary choices. We can tell whether a person has produced a periodic sentence even in an inane assignment, but we cannot tell whether it is an apt sentence until we know the purpose of the whole writing. In a particular classroom a teacher may decide on Monday to conduct a lesson on periodicity and may test on Friday to discover whether students can recognize or produce periodic sentences. The value of such a skill is merely assumed.

Our purposes in this world are so numerous and so mixed that we must seek a simplified model of discourse. We will reject the most subtle models as being too hard to use; we will still insist on some model in order to create meaningful contexts. The need for practical compromise which makes ETS scoring practically valuable affects even research studies. I prefer to use a three-part model (Lloyd-Jones, 1977), each part relating to one of the major variables in a rhetorical situation. Expressive writing grows from the need of writers to find the language to give shape to their conceptions; it is suffused with their values. Persuasive writing is directed to the needs of the reader; it is transactional and social. Reference writing is subject oriented; it is the language of science and the academy. These categories cannot be discrete because we are never in a situation without all three of the variables and thus all three of the primary motives, but most situations will be dominated by one, and good theoreticians and observers of language try to relate features of the language to the purposes.

The model may operate even without explicit theorizing. The writing sample which ETS now offers as part of the new college battery, for example, is directed to producing reference discourse. Implicitly the scores provided on the test will describe performance in terms of what we expect of academic writing. So far as I know ETS is not planning to provide scoring guides which make explicit the new emphasis, but the implication is clear that for work in college ETS is rating the left-brain folks as more suitable. For centuries we have known that some people are better at reference discourse than at other kinds of writing; ETS merely says that it is the kind of writing which is important to college students and thus defines college education in a particular way. If you agree, no harm. But if you think college education should be more, then you may be distressed, because the goals of education are being implied by the test. In fairness to ETS we should add that reference discourse is highly conventional. Because its rules are most readily codified and learned, it is the most readily produced under pressure and the most readily evaluated under pressure. That may be the fairest test as we know how to give tests. Perhaps because we can test it better than we can test or describe expression or persuasion, we find that what we can test we will teach.

In the real world we test persuasion by whether something sells, or someone gets elected, or we go off together in loving agreement. We test expression by whether the maker feels better and the readers feel the kinship of understanding. Such responses are hard to mimic in manufactured school games, so we try to rate by analogy with writing which really responds to a need. One of the standard bits of advice to teachers is to devise assignments which satisfy real purposes. One of the main justifications for the school newspaper is not to prepare students for journalism but to offer them a chance to write in circumstances which have meaning within the school society.

School papers which become burlesques of a perceived style of journalism fail in their proper purpose; school papers which are read because they contain real information and opinions demand real writing. One reason for expressive assignments is that they serve a real need of the student to make self-examinations. Unless the paper formulates and communicates something a student writer really wants to say, then it fails as rhetoric. Quite possibly that kind of failure accounts for a good part of some students' dislike of writing and of some teachers' boredom in reading student papers.

No communication exists without a purpose, and without communication (at least to oneself) a paper is bound to be dull. And what is difficult to do in the classroom is even more difficult to do in a test. Implicitly the purpose of any test is to allow the observed person to show off a skill, not to communicate the apparent subject but to exhibit a facility with language. The mock reason is just a vehicle for what the tester and the tested both know is the real purpose--to produce an imitation of communication. No writing sample taken for a test ever quite escapes that limit.

Completeness requires that we look at finger exercises for writers, though. Facility in playing the piano or in making sentences or even whole essays can be acquired by playing at games, and they do not have to be as dull as playing the scales. Most people like games of wit. Under friendly circumstances many students even like trying to write sonnets or to imitate some favorite performer. Imitation was one of the techniques of classical rhetoric, and so long as one knows it is a game played for the love of language and of the persons imitated, it is a joy. When teachers become pedantic about it, or force imitations of unlikely exemplars, then the exercises become counterproductive. One of the virtues of sentence combining done briefly and regularly is that it can become a game in which we all admire the deftness of the combiner as we admire the deftness of a good backhand return. Yet to capture under the implied conditions of a test the same playfulness of the exercise is to subdue the unicorn--a task to be assigned only to the totally innocent of heart. Whatever else a well-tested person may possess, innocence is not a usual characteristic.

In the real world, game playing with words is called literature. I think such fondness for literary language is the mark of civilization, but it is also idiosyncratic. That is one reason it is worth so much effort on the part of a single critic; pages can be devoted to stylistic criticism precisely because good verbal games are so deft, and all of us profit from having it pointed out to us how skillful some people are and how we might like to be as clever. The results of our games deserve and require the same kind of reading given to the good writers, and that is not the function of mass testing. Hence, the test system itself rules out much consideration of a real concern with literary language. That may be one reason we so often conduct mass testing of literature on knowledge of the monuments of literature rather than on the qualities of language which make literature. When the National Assessment of Educational Progress created a magnificent set of objectives relating to Americans' ability to handle literary language, they were stymied in devising affordable means of testing for the objectives.

Though in evaluating literature we are primarily concerned with the way the language is shaped into whole structures, still literature is just a heightening of the other purposes of discourse, often into a more evidently mimetic mode. The categories of reference (academic, scientific) prose do not report the natural joints of reality itself; as Plato suggested in the Phaedrus, they represent reality at a highly abstract level of organization determined by the needs of the language culture. When the purpose of reference discourse is transmuted into literary language, it represents a reality by selection rather than by category, but the underlying purpose remains. It is somewhat easier to realize that an author's point of view has mediated the vision of the world. Expressive and persuasive purposes evidently overlay the literary presentation, but even scientific discourse is persuasive ethically by virtue of its abstract form. We have been taught to believe ideas which are dressed in the language of science just as we are seduced by the ideas presented by a charming narrator.

These theoretical questions are represented in the reality of the second cycle of the writing assessment of the National Assessment, although so far the examinations of the data have not been completed. The three territories of discourse as mapped by purpose were accepted as the model, and exercises were devised in the hope of sampling students' abilities in dealing with all of the purposes. The assumption is that the author of a good technical engineering report may not in fact be able to report the same material well to a city council. If one wants to comment about a person's ability to discourse, one ought equally to specify in what range of discourse. If all three purposes are essential in the lives of mature humans, we ought not accept conclusions based upon the ability to handle only one kind.

In order to make its descriptions of the rated papers more useful, the National Assessment developed scoring guides with elaborate hypothesization of features likely to be present in appropriate responses. These guides represent the experienced observations of people steeped in the accumulated lore of the craft as they are verified in the performance of writers in trial performances. All of the usual problems of getting adequate samples of writing remain, but the new distinctions permit somewhat refined observations about discourse. Later we can perhaps work backward from what are judged to be effective examples of expressive discourse--for example, to make more precise descriptions of the features associated with this purpose. We will probably never predict expressiveness as well as we can reference, but we may develop better generalizations than we now have.

Since my purpose here is not to develop a report of the techniques by which these studies are to be made but to consider implications for teaching, let me repeat my fundamental uneasiness about depending upon research for justification of classroom work at this stage. Research has a long way to go before it catches up with learning as a source of knowledge. To be sure, a good researcher with sensitive restraint is better than a dogmatic transmitter of formulas, but that is equivalent to saying that a person who remains open to language as it is used is better than a person who is not. The first implication from which all others derive is that a teacher of writing must like language, must show that liking by crafting things in writing, must want to develop the craft itself by explaining the reasons or the patterns of occurrences of features, and must want to experience language in many contexts. At best this person is literary, but I need not mention that fashions in literary scholarship have often narrowed the scope of the trivium to pedantry over the minutiae of literature as well as the minutiae of language.

The second implication is that since competent research is likely to be severely limited, one must be cautious about reading results beyond the limits expressed in the work. Research which attempts to deal competently with large questions probably has large holes filled mostly with assumptions. The quality of the study may well depend upon the value of the assumption. The development of theoretical models of discourse seems to me to offer great possibilities for later testing in research, but the work has implications for the classroom at once by analogy and reasoning, not by controlled tests.

The third implication--the one which sent me back to Polanyi in the first place--is that by injudicious admiration of scientific methods we may be led to undervalue the areas of experience that we do not know how to observe and report en masse. We all like to make much of what we can do. A researcher who has finished a long study may be pardoned if he or she brags as though Monaco were all of Europe. We are pleased to discover one principality, but the world is left to be explored and it is not all like Monaco. If we narrow our classroom activities to deal only with the items that can be reported to the community or to the budget makers or to objectives writers or to minimal-competency legislators by means of current research, then we impoverish the community by refusing to teach what people need to know.

I am sorry that I am unable to be more affirmative in blocking out a line of action justified by research in order to solve all of the problems of literacy in society. I am even sorrier to feel that the solid research and hints of better to come might lead us to define literacy in such a narrow way--one based on what we can do reliably--that we will seriously damage our schools by ignoring the tacit and the uncategorized whole, by putting our efforts on the skills most readily demonstrated.

To put my thesis in a brutal form--research shows us very little indeed about the teaching of writing. Let us do more research but in the meantime insist that our policies be supported first by other sources of knowledge, and then, if possible, by research. The know-nothings must be answered, but good answers exist even outside of the scientific machinery.

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RESPONSE TO JOHN MELLON
AND RICHARD LLOYD-JONES

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I liked both Professor Mellon's and Professor Lloyd-Jones's papers. I learned a good deal from both. Let me make a few comments on each and then a few observations of my own about the teaching of writing. In both my comments and observations, my emphasis--for good or evil--will be upon the theory of writing--partly because that is what interests me most, partly because I believe that the whole enterprise of teaching writing suffers from neglect of theory. Professor Mellon guaranteed that everything he said would be relevant to work in the classroom. I guarantee that nothing I say will be.

Professor Mellon's paper is both an excellent report on recent research--many things I knew nothing at all about --and a very thorough taxonomy of writing competences. His emphasis upon the great variety of competences involved is especially important. In recent years, there has been a tendency, unwittingly encouraged by the work of Noam Chomsky, to believe that only one competence--knowledge of grammatical rules--is involved. Moreover, his distinction between two kinds of knowledge, knowing-*how* and knowing-*that*, which I will return to, is certainly necessary. He is right, furthermore, about students' needing a knowing-*that* knowledge of grammar. If we want to talk to students about their writing, they must share a grammatical vocabulary with us, and that might as well be the standard vocabulary for surface-structure analysis. Indeed, arguments for teaching grammar for its own sake are as good as those for teaching any other body of knowledge for its intrinsic interest. Not all knowing-*that* knowledge need have practical value in promoting knowing-*how*--in promoting knowing how to write, for example, or to speak or read. Finally, I like Professor Mellon's practical recommendations for teaching writing--especially his avoidance of slogans and gimmicks and his recognition of how very complex an activity writing is.

Like Professor Mellon's paper, Professor Lloyd-Jones's is full of good things:

1. His emphasis upon traditional lore, upon how much has been known about writing and speaking for centuries. Researchers ignorant of it reinvent the wheel every 10 years--discovering things about metaphor, for instance, that were commonplaces in the Renaissance.

2. His distrust of controlled research. I recall George Miller's saying here some years ago that controlled experiments in psychology either turn out the way they are expected to (in which case there is no need to make them) or do not (in which case they are badly designed).

3. His pointing out our lamentable tendency to see all problems as solvable by the knowledge or the machinery we happen to have--computers, for instance.

4. His distinguishing between correctness and effectiveness, which is like the distinction between our playing chess correctly (following the rules of chess) and our playing it successfully (winning more games than we lose). Writing well is not simply a matter of following rules.

5. His saying that all writing is creative. Writing something is never a process in the sense that making an apple pie is. There are no algorithms or recipes for producing written products. Indeed, we do not know what the product is like until we have produced it.

6. Finally, his emphasis upon the factitiousness of most writing done in testing and in college classes, which has no real purpose or reader--no purpose other than getting a grade or satisfying a teacher who has peculiar requirements. An imitation of communication is a good name for it.

Turning now to observations, my first is--and I suspect that Professor Mellon and Professor Lloyd-Jones would accept it--that writing is a great mystery. What is most striking is not what we know but what we do not know about it. For one thing, we do not know what makes some writing better than other. We know in an intuitive, practical, knowing-how way that some writing is better than other, but not in a theoretical, knowing-that way. For another thing, we do not know how people learn how to write or what they do when they are writing well or even when they are writing poorly. Moreover, we do not know much, except in an intuitive, knowing-how way, about how to teach people who do not write well how to write well or even worse. We know little about the product, the activity, or teaching the activity.

My second observation is that the practice of any activity whatsoever--writing, reading, swimming, no matter what--must precede the theory of it. Theory must come after practice; otherwise the theory has no object. To put this in another way, what must come first is the phenomenon --the motions of the planets, the transfer of heat, speaking or writing English--then the theory of it. This point is worth stressing because it is so much neglected in matters of language--in literary studies, for instance, where the usual assumption is that the function of a theory of literature is to teach people how to read poems well. The correct assumption, I believe, is that, for any poem whatsoever or for any other discourse, there is a body of readers who know how to read it and that the task of a theory of literature is to explain how they do it--to make explicit, for example, what they must know to do it.

How is this observation relevant to the teaching of writing? We must, I believe, begin with the practice of good writing and then try to formulate a theory of good writing. We must begin with the writing of those people who, our intuitions tell us, write well and try to figure out what distinguishes their product and their activity from those of people who write poorly. What are the characteristics of good writing? What do good writers have to know to write well? What do they do when they write well?

Once we have a theory of good writing--actually two interlocking theories (what I later call a rhetorical competence theory and rhetorical performance theory)--we can go to work on a theory of teaching good writing to people who do not write well (what I later call a rhetorical pedagogical theory). In other words, once we have a science of writing, we can go on to a technology of it. Perhaps our greatest mistake in trying to teach writing is to imagine that we can have the technology without the science--horticulture without botany, animal husbandry without zoology, engineering without physics.

Let us look now at my four taxonomies (Figures 1 to 4). They are not, I think, incompatible with what Professors Mellon and Lloyd-Jones say. Indeed, the first one merely restates a distinction both of them make: between knowing-how and knowing-that. Perhaps my taxonomies, however, can give unity and generality to their variety--without, I hope, doing violence to it.

First, I want to say a few words more about the distinction between knowing-how and knowing-that (Figure 1). Knowing-how is implicit, unformulated, practical knowledge

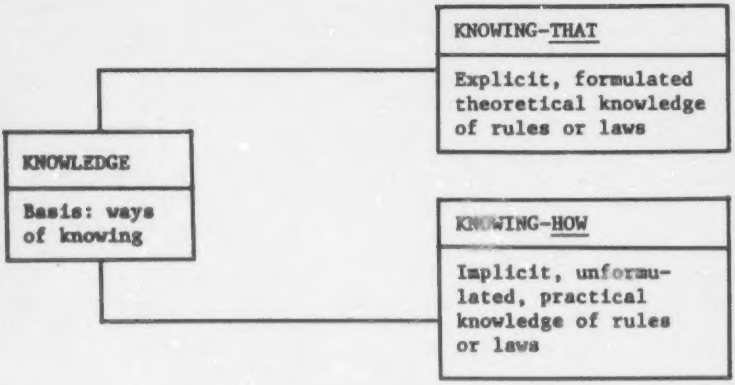

KNOWLEDGE
Basis: ways of knowing
KNOWING-THAT
Explicit, formulated theoretical knowledge of rules or laws
KNOWING-HOW
Implicit, unformulated, practical knowledge of rules or laws

Figure 1. Taxonomy I.

of rules or laws. It is knowing how to use rules or laws, how to do something with them--how to speak English, for example, or how to write well. Knowing-*that*, on the other hand, is explicit, formulated, *theoretical* knowledge of rules or laws. It is knowing that they are such and such, knowing how to formulate or describe them--being able to say, for example, that the indefinite article *a* comes before a consonant and *an* before a vowel.

This distinction is quite generally applicable to human activities, not just to linguistic ones. I know how to ride a bicycle, for instance; that is, I have practical knowledge. Show me a bicycle, and I can get on it, stay upright, and pedal it down the street. I have practical knowledge of the laws of statics and dynamics relevant to bicycle riding. But I have no theoretical knowledge of them. None at all. I cannot formulate or describe any of them--and, if my only aim is to ride a bicycle, I do not need to. Having practical knowledge does not presuppose having theoretical. Indeed, as we have seen, someone's practice must precede anyone's theory. Nor does someone's having theoretical knowledge presuppose that person's having practical knowledge. No doubt all--or almost all--physicists have theoretical knowledge of the laws of statics and dynamics relevant to bicycle riding. Perhaps some, however, have no practical knowledge. They can formulate the laws, but they cannot ride a bicycle.

One way of classifying knowledge, then, is upon the basis of ways of knowing: knowing-how and knowing-that. Another (Figure 2) is on the basis of things known: laws, rules, and particular facts.

Laws are often--even by linguists--confused with rules. But they are fundamentally different. Laws are simply regularities of behavior, human or otherwise: people blinking in a strong light, blushing when embarrassed; the sun setting in the west; the planets going around the sun in elliptical orbits. Given certain conditions, such and such happens. But though observances of rules can be regularities of behavior, rules themselves are not. They are in some sense decisions or agreements by humans to behave under certain conditions in certain ways.

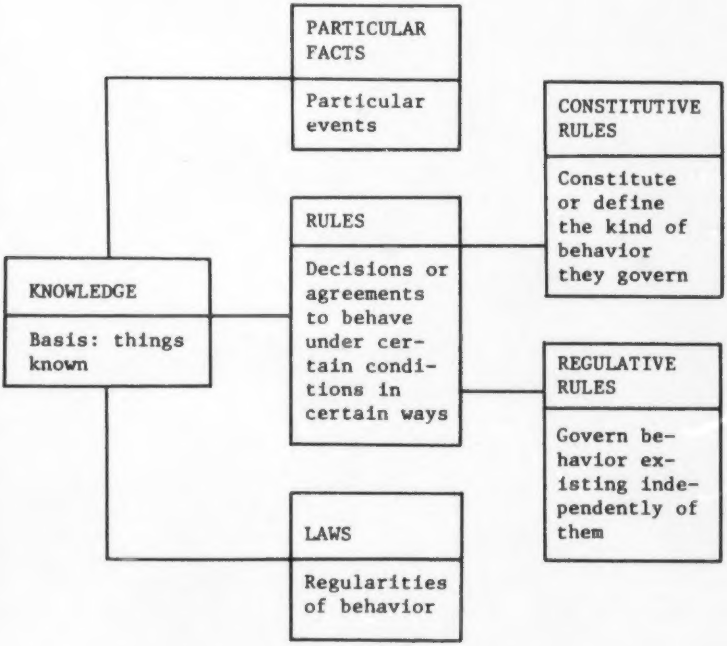

PARTICULAR FACTS
Particular events
CONSTITUTIVE RULES
Constitute or define the kind of behavior they govern
RULES
Decisions or agreements to behave under certain conditions in certain ways
KNOWLEDGE
Basis: things known
REGULATIVE RULES
Govern behavior existing independently of them
LAWS
Regularities of behavior

Figure 2. Taxonomy II.

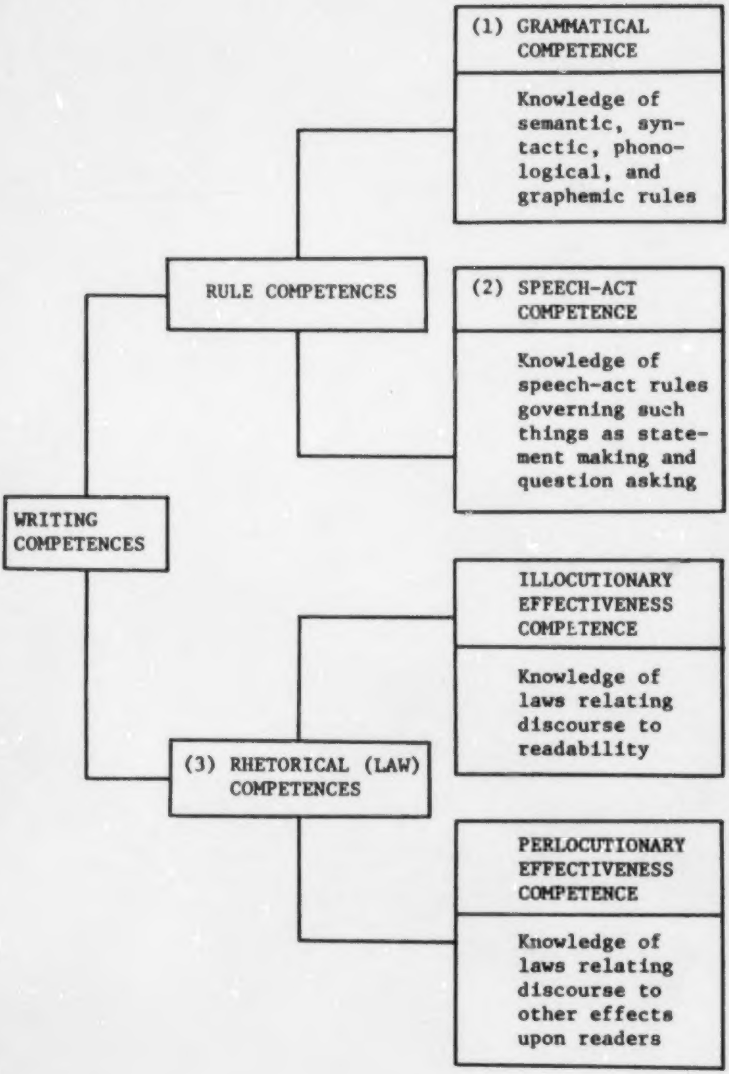
Rules are either regulative or constitutive. Regulative rules govern behavior existing independently of them. Rules governing motor traffic, for instance, are regulative, and so are rules governing eating--such as which implement to use for which food and the like. People would drive motor cars and eat even if there were no rules at all. Constitutive rules, on the other hand, constitute or define the kind of behavior they govern. Rules of games are classic paradigm cases of constitutive rules. Before the rules of Monopoly were created, there was no such thing as Monopoly or playing Monopoly. Monopoly is the rules of Monopoly. Grammatical rules--semantic, syntactic, phonological, and graphemic rules--are also constitutive. English is the grammatical rules of English. No rules, no language.

We can, then, have knowledge of both laws and rules, but they are different things. We can have knowledge also of particular facts--of someone's blinking or blushing at a particular time, of a particular sunset, of a particular planet going around the sun at a particular time, of a particular game of Monopoly played at a particular time (who played, who won), or of what someone said at a particular time (say, Lincoln's Gettysburg address).

Now for writing competences (Figure 3). Competence (or competency) is another word for knowledge--generally, though not necessarily, for practical, knowing-how knowledge. Professor Mellon gives a thorough taxonomy of the great variety of competences involved in writing. Almost all of them may, I think, be gathered into two main classes: rule competences and rhetorical (or law) competences--all practical, knowing-how knowledge.

A rule competence is simply practical knowledge of rules--either of grammatical rules (grammatical competence) or of speech-act rules, rules governing illocutionary acts like statement-making and question-asking (speech-act competence). To write at all--well or poorly--we must know these rules; they govern our behavior when we are writing.

Govern, of course, does not mean "uniquely determine." For one thing, rule competences are not the only competences. Other competences also govern our writing--notably rhetorical competences, but also knowledge of particular facts. To return to a distinction Professor Lloyd-Jones makes, the domain of rule competences is correct writing--by definition, writing following the rules--not effective writing. For another thing, performance--here, writing--need not, and rarely does, match competence. Knowing rules does not guarantee our following them. We can break gram-


WRITING COMPETENCES
RULE COMPETENCES
(1) GRAMMATICAL COMPETENCE
Knowledge of semantic, syntactic, phonological, and graphemic rules
(2) SPEECH-ACT COMPETENCE
Knowledge of speech-act rules governing such things as statement making and question asking
(3) RHETORICAL (LAW) COMPETENCES
ILLOCUTIONARY EFFECTIVENESS COMPETENCE
Knowledge of laws relating discourse to readability
PERLOCUTIONARY EFFECTIVENESS COMPETENCE
Knowledge of laws relating discourse to other effects upon readers

Note: (3) presupposes (1) and (2); (2) presupposes (1).

Figure 3. Taxonomy III.

matical or speech-act rules in much the way we can break the rules of Monopoly in playing that game or break the rules of arithmetic in balancing our checkbooks--either unintentionally (because we are tired or have a headache, say) or intentionally (because we want to cheat or *épater la bourgeoisie*, or just for the hell of it). Finally, things other than competences--motives, purposes, intentions, desires--also govern our writing. Why do we write a certain letter or essay? Why do we say what we say in it? Not solely, surely, because of our competences.

All this, of course, is well established. It is no news to anyone that we have rule competences--that our writing is governed by our practical knowledge of grammatical and speech-act rules. What may be news to some is that we also have rhetorical (or law) competences--that our writing is also governed by our practical knowledge of laws relating features of discourse to features of readers' responses to it. The domain of rhetorical competences is *effective* writing--writing that has the effects upon readers we intend it to have.

By distinguishing between illocutionary effect and perlocutionary effect, speech-act theory lays a basis for distinguishing two rhetorical competences: illocutionary-effectiveness competence and perlocutionary-effectiveness competence. Any discourse--any performance of an illocutionary act like statement-making or question-asking--has two effects upon competent readers or listeners. One effect is simply their understanding or interpreting the discourse--simply getting the message. This is the illocutionary effect. The other effect is any subsequent effect--reacting to the message. This is the perlocutionary effect. Believing or disbelieving a statement, for instance, is a perlocutionary effect, and so is answering a question with yes or no or ignoring it.

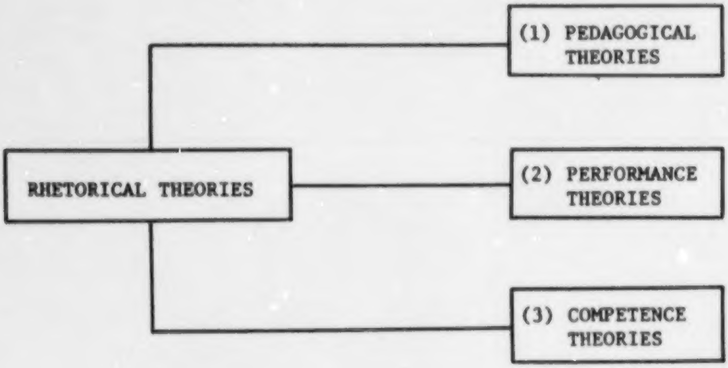
There can be chains of perlocutionary effect. President Nixon, for example, once ordered some general to invade Cambodia (the illocutionary act of giving a certain order). That general understood this statement; he got the message (the illocutionary effect). Then (no doubt) he said, "Yes, sir" (Perlocutionary Effect 1); then he issued orders to subordinates (PE 2); then troops invaded Cambodia (PE 3); then Cambodians died (PE 4), students rioted (PE 5), national guardsmen killed students at Kent State (PE 6), and so on.

There are, then, two kinds of effectiveness: illocutionary effectiveness and perlocutionary effectiveness.

This distinction is, I believe, implicit in traditional rhetoric. Informally put, it is the distinction between writing clearly (getting our message through) and writing persuasively (so as to accomplish our purpose in writing). Put more technically, it is the distinction between successfully using our illocutionary-effectiveness competence (our practical knowledge of laws relating features of discourse to readability--that is, to the ease with which readers experience the illocutionary effect) and successfully using our perlocutionary-effectiveness competence (our practical knowledge of laws relating features of discourse to other effects upon readers).

Investigating these two kinds of effectiveness might well, I suggest, answer the question of what good writing is. Good writing would be both illocutionarily and perlocutionarily effective. Illocutionary effectiveness would be measured by the ease with which readers read the discourse in question. This has been the object of 25 years or more of readability research. Perlocutionary effectiveness would be measured by the extent to which readers do what we intend them to do--believe a statement, answer a question, or carry out an order. In either case, goodness would inhere not in the discourse itself but in the relationship between it and the readers who read it.

Finally, a few words about rhetorical theories (Figure 4). There are, it seems to me, three kinds--pedagogical theories, performance theories, and competence theories--and the third is the basic one. Without it, the other two have no basis. The purpose of a rhetorical competence theory is to describe illocutionary-effectiveness competence and perlocutionary-effectiveness competence and thus to describe both the laws relating features of discourse to readability and the laws relating them to other effects upon readers. The purpose of a rhetorical performance theory is to describe what people who write well do--to describe what goes on psychologically, neurologically, and physiologically when they acquire their rhetorical competences and when they use them in writing well (performing well). A performance theory presupposes--indeed, must incorporate--a competence theory. A theory of what goes on when people acquire rhetorical competences and when they use them must incorporate a theory describing them. The purpose of a rhetorical pedagogical theory is to describe how people can acquire rhetorical competences through formal instruction--that is, how they can acquire them by being taught them. Obviously, a pedagogical theory presupposes both a competence theory and a performance theory.



Note: (1) presupposes (2) and (3); (2) presupposes (3). (1) is to (2) and (3) as horticulture is to botany, as animal husbandry is to zoology, as engineering is to physics.

Figure 4. Taxonomy IV.

Perhaps, as I suggested earlier, our greatest mistake in trying to teach writing is to imagine that we can have a pedagogical theory without first having both a competence theory and a performance theory--that we can have a technology without first having a science. Perhaps, indeed, the failure of much educational psychology is due to the failure to recognize that, in psychology, a performance theory must presuppose a competence theory, and a pedagogical theory must presuppose both. Any learning theory, for example, is a performance theory. But research into learning theory has generally assumed that it can proceed without any description of what is learned, of what people know--without a competence theory.

A CRANK'S CASE FOR RESOLVING THE LITERACY CRISIS

RESPONSE TO JOHN MELLON AND RICHARD LLOYD-JONES

Harriet Sheridan
Carleton College

Unlike Dickens, who wrote to readers of his serialized novels, "I send you this labour of love," or Samuel Johnson, who reportedly composed Rasselas in the evenings of a week to pay for his mother's funeral, most of us find writing an agonizing struggle, conducted by fits and starts, with intervals tying up our tomato plants or polishing the bottom of the copper pot that will surely darken the next time it is set on the stove.

To discover how professional writers write is at once instructive and heartening. "I can't write five words but that I change seven," Dorothy Parker confided to an interviewer for the Paris Review (Writers at Work, 1958, p. 79). James Thurber commented to another interviewer: "For me it's mostly a question of rewriting. It's part of a constant attempt on my part to make the finished version smooth, to make it seem effortless" (p. 88). Asked to respond to the statement that all a writer really needs is a place to work and tobacco, food, and good whiskey, Thornton Wilder replied rather stiffly: "Many writers have told me that they have built up mnemonic devices to start them off on each day's writing task. Hemingway once told me he sharpened twenty pencils. Willa Cather that she read a passage from the Bible (not from piety, she was quick to add, but to get in touch with fine prose...). My springboard has always been long walks. I drink a great deal, but I do not associate it with writing" (p. 94).

You can see that I am building up an a fortiori case here: if writing is hard for a Wilder, a Hemingway, a Thurber, and other serious professional writers, how much harder it must be for the innocent students who fall into our hands in beginning composition courses. Now it is true that professional writers such as these are creating works of the imagination that represent the highest form of language use. Yet it is also true that students who face the daunting task of writing a critique of some historical text or some philosophical system are likely to create a work of the imagination--that is, when they are not copying from some convenient portable critic. To write in vacuo is hard for anyone.

Furthermore, to write without particularly knowing one's subject or caring about it, or knowing one's audience or caring about it, or knowing oneself and caring very much instinctively--this kind of writing seems to me very hard to do. And this is the kind of writing that we are constantly demanding of our students. We do not do this now to humble them (as the forties might have recommended) or to humiliate them (as the sixties would have complained) but to provide them with the skill that allows them to articulate their thoughts. Although our reason is good, however, our methods are out of step with today's needs.

It is discouraging that after so many decades--after Aristotle and Cicero and Quintilian, after Erasmus' On Copia, after Blair and Campbell and Kenneth Burke, and even after Rollo Brown's How the French Boy Learns to Write--we are still agonizing not merely over our students' writing (as well as our own) but over the best ways of developing writing skills.

However, I will end this long preamble and get down to what I choose to be my chief questions for this discussion: (a) where does good writing come from? (b) of what does it consist? (c) how do you go about teaching it or developing it? and (d) what do I think of what Professors Lloyd-Jones and Mellon have to say about these questions?

I will begin by citing two passages of ordinary prose, the first written by a 10-year-old and the second by an 11-year-old.

> Mama finely took me to the amusement pier today. It's the best place--we rode on the boat slide three times but we didn't go on the loop-it-de-loo--we were afraid. I never saw so many games in my whole life. Everything costs ten cents and sometimes you win a prise. I tried to throw some hoops around a square stick but that was hard. I finely won a doll by poppin balloons with some darts. I had two great big spun sugar sticks and a hot dog and Mama says we can come back again.

The second reads:

> I write here many things I never tell anyone.

> Today when I opened a book at hazard, I read: "Life is only a sad reality." Is it true? Perhaps! I have never discussed this. Today I want to know, and even though my diary is dumb, I will ask: Is it true? Oh, if anyone asked me this on my dark, sad days when I was thinking of father--oh, I would certainly say yes, but that is all. Certainly I have not suffered yet--I am only eleven, and I cannot say; I must wait longer before I can answer this question!
>
> Though my curiosity is not satisfied, I resign myself to talk about other things. When I see a beggar, I want to be rich, merely to help him. I ask myself, how is it possible there should *be* beggars with so many rich men on earth? Only it is true, many rich men don't give. If I could only give, give! With this idea I gathered all my toys to give to the chapel.
>
> I don't know what is wrong with me. I confess that question--is life only a sad reality?--occupies my mind. Silly idea! No doubt I have many silly notions, many crazy ones. I know. I admit it. Just the same--I want to know.

I think you will agree that the first passage is not particularly distinguished. It may be better writing than most 10-year-olds are capable of today, but it is not much better than any other youthful effusion over the delights of a carnival. Its author, Margaret O'Brien, began the diary from which this passage is taken at a time when, as the chief child actress in Hollywood, she was being paid $1,000 a week and struggling to earn an additional monthly 25 cents from her mother for not forgetting to wash behind her ears (Berger & Berger, 1966, pp. 74-77).

The second passage is another matter altogether. Although its author was only chronologically a year older than Margaret, she was centuries older in philanthropic instinct and style. Her spelling is better, yet her diction is just as simple as Margaret's. But the rhythm of her prose, the graceful use of schemes and tropes, mark the author, Anaïs Nin, as an intuitive master of composition who needed no teacher. Later in life, in a lecture before a writer's conference, she said: "It is important to keep a notebook. First because it puts you at ease with writing. It is informal. Then, because the keeping of notes becomes a discipline, like sketching for the artist. It was while keeping notebooks that I discovered how to capture the living moment" (Berger & Berger, 1966, pp. 5-6).

Let me extract from a comparison of these two passages --and a backward look at Willa Cather--part of the answer to my first question: where does good writing come from? It comes from reading and reading and writing and writing--and doing both with a finely tuned ear which very likely comes from God. This last phrase might set off a reverberation in someone's thought that will lead to an objection to my syllogism. It might be argued, for example, that although John Bunyan was the author of a work that had considerable influence on English prose style, he was an unlearned man. To which imaginary objection I respond: unlearned, yes, but a devoted reader of the Bible. The syntax of *Pilgrim's Progress* exhibits this influence in a memorable way.

The tuning of the inner ear that listens as we read and write is not accomplished by command or entreaty or workbook drills. It used to be accomplished for some (never for all) who read and had read to them--at an age when they were most likely to be impressed--the works of authors who cared for sound and sense. No more. I will not dally with the subject of today's computerized reading texts and the deadly principle of mastery except to refer to an interesting recent observation about the decay of American education made by the author of *Fire in the Lake*, Frances FitzGerald. Writing about "Why American History Bores Our Children" (1977), she observes: "Texts are organized in a string of short paragraphs which describe events without committing themselves to any one view of development. There are no consequences to anything....No respectable historian would even bother to criticize such failings, yet this is how history gets taught, or at least written" (p. 7).

All this may sound as if I am fatuously and sentimentally refusing to recognize the realities of our life today, refusing to accept the facts that it is easier to turn a knob than to open a book, easier to pick up the phone than to write a letter, and that all of us will sooner or later, and more or less surrender to sloth.

Yet if these are the realities, we can accept them without an unconditional surrender. Real reading and repeated writing in the early years of education and the conditioning of an attention span that lasts even after the echoes of a gunshot have faded away--these are the prerequisites of good writing. Where does good writing come from then? It comes from reading and writing early, as early as life begins it, in the language used at home and in the street as well as in the classroom.

Let me offer the results, with considerable deference, of informal and unscientific research I have conducted over the three decades of my composition teaching, which began with elementary school students and wound its way through high schools and colleges. I calculate that I have read upwards of 20,000 compositions of one sort or another, in one way or another. I have been as guilty as the next one of assigning uninspired topics (no one ever told me not to) and of diabolically pursuing errors of omission and commission.

Yet I have a powerful--if unscientific--recollection of one triumph in the classroom that took place during a hot spring on the Lower East Side of New York City. As a callow graduate student in Old and Middle English studies, casting desperately about for a means of quieting a restless mix of polyglot fifth graders, I began to recite the livelier passages of Beowulf in a spontaneous modernization. Silence descended on the class, in an age before television's influence had dulled the senses and stirred the taste for random violence. "Write me an account of a brawl you've seen or been in as if you were the Beowulf poet," I commanded. Thirty years later I can truthfully say, wistfully, that those were the liveliest, most joyous, if most ungrammatical compositions ever set before me. The ingredients were right: a powerful model, an intuitive response, a common experience.

Thus, my first significant research finding about composition is that language use is imitative and mysterious. From the ancient experiments of a Pharoah who caused infants to be isolated with dumb shepherds tending their flocks--and who then were reputed to have uttered as their first sounds the peculiar noises made by Egyptian sheep--through the various observations pseudo- and quasi-scientific made about "wolf" boys, up to the conclusions of researchers into less exotic and hairy forms of linguistic accomplishment, we know that language behavior has pretty well been laid down before the child gets to school. The speech environment makes its imprint. Whether or not the child has a sensitive ear has its effect. The synapses in the right--or is it the left?--hemisphere affect the language learning capabilities. The psychological nature of the speaker exerts its influence on the way language is used, and the way language is used has its effect on the psychological condition. Everything we say is in the middle of what has been said and what will be said. In sum, and once again, literacy or illiteracy begins before the child ever reaches the English teacher.

My second significant research finding about composition is that those who like to teach composition teach it better than those who do not. Consider what happens when the student finally does meet the English teacher. Would it be a misleading statement to say that many duly certified English teachers on all levels, from elementary school to college, do not like to write, do not write well themselves, do not like to teach composition, and do not know how to teach it? And many students with tin ears and pulses throbbing to "Charlie's Angels" are going to school with those indifferent teachers. Not only is the level of literacy not going to rise one iota as a result, but the level of desire to become more literate is going to decline.

Let us be positive-thinking and assume that the student who has not read much or written anything meets an English teacher who is full of good intentions and wants to teach students how to write well. It is true that no one has ever taught her how, beyond some galvanic twitches produced by the various transformations of Paul Roberts's textbook revolutions, but in spite of her undeveloped teaching skills, her instincts are good. However, no one is about to allow her to do under reasonable working conditions what she does know about: small classes, pre-writing, conferences, revisions, all dependent upon her students' having developed an attention span longer than a gerbil's. My third significant research finding is that teachers who want to teach writing need some help from the society in order to accomplish so difficult a task that even Hemingway had to sharpen 20 pencils before he set to work.

Let me take up now my second question: of what does good writing consist? I am talking now of the kind of "speech acts" that Aristotle wrote his Rhetoric about, Quintilian his De Institutione Oratoria, Campbell his Philosophy of Rhetoric, Vygotsky his Thought and Language, and E. B. White his Elements of Style. That is, I am talking now of informed and lucid discourse. The two capital secrets of prose, DeQuincey wrote, are "the philosophy of transition and connection, or the art by which one step in the evolution of thoughts is made to arise out of another ... and ... the way in which sentences are made to modify each other" (Autobiographic Sketches). This is writing that communicates the record of a mind at work in a public way, so that the completion of the communication is not dependent on familiarity with an arcane or restricted or idiosyncratic system. And such public writing is heavily dependent on the development of a vocabulary sufficiently precise and diverse to allow for the expression of the widest range of thoughts and feelings. "I have forgotten the word I intended to say, and my thought, disembodied, returns to the realm of the shadows" (Mandelstam).

If, in order to write about matters above the level of survival you need a lexicon of some diversity, and you have not been in the habit of registering what you read--if indeed you read at all--where will this lexicon come from? Now we stumble upon my fourth significant research finding: verbal communication depends upon the possession and careful use of words. No lexicon means no written communication, though there may be plenty of body language. But who teaches words? And who besides Humpty-Dumpty and Lardner and Orwell and Newman cares about words any more? If there is a story in it, maybe journalists will show some interest from time to time. The New York Times seems to care enough to feature the decline of literacy on a front page pockmarked with solecisms and typos. The working vocabulary of bright young freshmen would make you weep with pity for its poverty. The pleasure that students take in new words, and in the etymologies of words that give them a mnemonic handle, should send all lovers of the Phantom Tollbooth, who also happen to be English teachers, back to their Skeat and Onions.

Of course, it might be argued that, though not knowing words makes the communication of ideas difficult, knowing too many words makes communication a very delicate, even painful process: of sizing up the audience (fake or for real), of determining what the writing was intended to accomplish (instruct or delight), of deciding how much of oneself one wanted to show (neutered or pouring forth one's soul abroad in such an ecstasy). A pleasurable pain, and one that I think we owe to our students to feel. Rather than leave them to do bee dances to signal the honey, why don't we give them a flying start at sophisticated human discourse beyond the hum?

I come now to the most provoking of my significant research findings: going back to the basics is what English teachers will do to themselves as penance, contrite about their failure to produce writing angels from students who do not read, cannot concentrate, and will not elect writing courses. Remember those basics? Remember those endless workbook exercises diagramming sentences, those spelling drills, those vocabulary lessons in a vacuum? Remember how discouraged we were, how bored we were, how we stirred our blood by being righteously indignant about misspellings? And how liberated were we when the first intimations that classical grammar was really not applicable to modern English were expressed, and the first research findings that students who were good at grammar were not necessarily good at writing were published.

Is it true that the students of the seventies are in a more illiterate stage than their predecessors in the age of the book were? As I ask this, I have a pang of uneasiness that I am falling into the crabbed rhetoric of the aged, the last survivor of the age of enlightenment deploring the times and the mores. And I wonder uneasily if we should regard this new clamor about the decline of literacy as simply the latest in a periodic clamor, or if, in fact, there is a lesson to be learned from the story of the mother dinosaur who advised her young to stop complaining, telling them: "It's true it's getting colder every year, but it can't be as bad as you say."

For several years, I have been constructing test items for one of the leading college entrance testing services. A peculiar pleasure is attached to this chore, which involves first composing a passage of a designated length on a topic which must be immediately alluring, like the legend of Dracula or the mystery of Easter Island, and then creating 20 errors or so of a very specific, stylized kind. The errors are, of course, typically errors of usage, although one of the categories, the hardest of all to fill in, calls for errors in logic and coherence. The rules of this game are elaborately detailed: an identical number of "distractors" for each test of grammar, punctuation, sentence structure, and so on--nothing so obviously wrong as to be immediately evident and nothing so subtle as to call for the exercise of sensitive discrimination or real thought. Now the interesting fact about these tests is that the directions for the construction of the test items for the students have remained unchanged, whereas the directions to the authors of the test passage have become more elaborate and admonitory. Let me give you an example of the most recent advice deemed necessary for these authors:

> Now is the time to apply the same principles you strive to inculcate in your own students: keep the essay consistent in logic and structure, especially within each paragraph; construct it so that it has a discernible beginning, middle, and ending

> and is not an inconclusive fragment; maintain tight control over content so that your meaning is absolutely clear and not subject to misinterpretation because of loose sentence structure or injudicious choice of words.

Physician, mend thyself! Back to the basics for whom?

I come now to my third question: how do you go about teaching or developing writing? A question simply answered. You go about teaching writing by teaching writing. This means everybody teaching writing, in fact, in all the disciplines, not merely English teachers. Not many of us are engaged in teaching writing in our students' vulnerable years. Not many of us ever were. Not because Aristotle and Rollo Brown and NCTE were not there to advise us, but because we had too many restless students, and too little time, and too many themes to read and comment on during the evenings in which we were also living our lives and skimming books and preparing for the next day's classes. A dearth of research about "sentence combining" and "minimum essentials" and "the psychological pressure of the examination situation" and "criteria of maturing style" is not what has handicapped us in the teaching of writing. We have had good advice from Corbett and Gibson and Baker and Hall and Christensen and Martin and Ohmann and Moffett and Murray and Guth. And we are getting more from others like Walter Loban and Wayne Booth and Richard Lloyd-Jones and Richard Beach.

What has handicapped us in the teaching of writing is, then, not ignorance or wont of will. Let me say openly and simply--should you have any doubt at this point about the tenor of my remarks--that I do not think that literacy is a scholarly issue to be resolved by research and the rational application of its findings, but a political issue. Teaching writing requires teachers who are prepared to teach writing joyfully and hopefully and who are freed from the burdens of other irrelevant duties by a taxpaying public and an educational administration that wants them to teach writing. I do not think we are ready for this yet.

And now for the last question, to which all that has gone before was merely a diversionary tactic to postpone my getting down to the basics: what do I think of what Professors Lloyd-Jones and Mellon have to say about these questions?

For Professor Mellon's "A Taxonomy of Compositional

Competencies," I feel the same pleasure as I experienced when I first plunged into the pages of Syntactic Structures. I find his introductory paragraphs lucid and reasonable, and I am filled with wonder and gratitude to him that he would undertake such a work.

To Professor Lloyd-Jones's essay, "Sources of Knowledge about Literacy," I responded with the unexpected pleasure of discovering a brother--a younger brother. We may not talk in the same dialect, he and I, but we certainly think alike. I hope he is not alarmed by this comparison. I would change nothing in his comments except to add a third factor, reflective experience, to his conclusion that "somewhere scholarship and research meet."

Professor Lloyd-Jones has identified as a serious obstacle to the teaching of writing the overwhelming masses of students who will be poorly served by techniques adapted for the individual and the attendant danger that arises when, in order to handle the mass need, we settle for less and less in accomplishment, for whatever we can test for. Bravo, brother! The danger inherent in what I take to be the ebbing tide of competency-based behavioral education was exactly this: what can be tested and exhibited is what has been learned. Ergo, teach for the test. The computer that was lodged at the University of Pittsburgh 10 or 12 years ago to score compositions--thereby relieving English teachers of this tedium--collapsed when someone fed it e. e. cummings. The coherence of E. B. White is not the coherence of Norman Mailer is not the coherence of the National Assessment, and no test yet developed can be scored credibly without the influence of subjective taste and judgment fore and aft. Professor Lloyd-Jones has given us an important warning about the suicidal impulses within our own profession.

I appreciate another of his points because I think I am personally susceptible to its warning. Anything done mechanically and repetitively, out of the context of normal need and interest, "when teachers become pedantic" or polemical, loses the message because of the medium. So much for workbook mentalities!

But best of all, I applaud his adjuration about surrendering to research those decisions that our informed judgment of classroom needs ought to make. Like him, I do not mean to denigrate research but simply to put it in its place as the supplier of answers to questions asked by devoted practitioners of the art of teaching writing, not as the asker of the only questions that are officially approved.

There is more to be learned by those who believe that literacy is not a lost cause by puzzling out the meaning of these lines from Gertrude Stein's How to Write (a book that would be deadly in the hands of the impressionable):

> Now then a difficult sentence not only has adroitness grammar and a name and with this they could follow it with not alone but not alone makes it a delight and delight a polite .... A difficult sentence can make a letter.

And there is more to be learned in looking through Jonathan Baumbach's Writers as Teachers, Teachers as Writers (1970) than in most of the research about composition that I have for my soul's sake read and for my head's sake forgotten.

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SYNOPSIS AND PROGNOSIS

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The immediate background for this volume is familiar to each of us. We are all aware of certain media-event characteristics of the so-called literacy crisis. If some more pessimistic observers of the current scene are right, 100 years from now the grammar and lexis of written English will be indistinguishable from speech: tense markers and other fussy, irregular aspects of its grammar will be gone and forgotten as we complete our long cultural slide toward solecism.

And so, there it is. For something over the past 2 or 3 years, in Time, Newsweek, the New York Times, Harpers, Change, The Chronicle of Higher Education, and the Dallas Times Herald, we have read that we are in the midst of a national crisis in literacy, with a generation of our children apparently losing any real ability to read or write coherently. Because for Americans linguistic behavior is intimately linked to issues of civic order and rectitude, the decline in scores on tests of verbal ability has been displayed along with selected examples of adolescent antiphrasis and offered as a symptom of deep social malaise, a malaise whose causes have been variously sought in color television, structural linguistics, and hillbilly music. Both the evidence and the hearsay have been widely reported and have contributed to growing public concern. The measure of that concern may be taken in the swift action of several states toward enactment of minimum competency laws and in growing public demand for a movement "back to the basics," to a nostalgic regimen of linguistic enculturation which earlier made us strong and literate and happy.

It is not my intention to discount the seriousness of public reaction nor the underlying concern which fuels it. It is rather to highlight a tendency to substitute shibboleths and nostalgia for comprehensive assessment of and policy for achieving a standard of literacy appropriate to our technical needs and our human aspirations. Clearly, we face major problems in this enterprise. Evidence pointing to the fact that something like one-third of the students graduating from high schools can obtain little or no information from textbooks, news articles, and other written materials (Bormuth, 1968; Hansen & Hesse, 1974) is sobering without consideration of the considerably more ambiguous statistical decline in formal tests of reading achievement. Similarly, our efforts to develop skill and ability in writing have been limited and halting. Clearly, there is a problem. Unfortunately, the reported 10-year decline in tests of verbal ability does not constitute an adequate measure of the problem, nor does it provide any substantial guidance for revising educational or social policies associated with it.

The complexity attaching to the issues surrounding the development of such policy is little understood, a fact which contributes to the substitution of clichés and formulary responses for considered policy. In this context it is important to recognize that definition and assessment of literacy are neither fixed nor absolute but relative--dependent on society's technical needs and social norms and possessing both economic and political valence. Such relative definitions as we have been offered accord with and help to illustrate the close but very complex relations between culture, society, and norms of communicative conduct (Ong, 1971). That is to say that a standard or concept of literacy, of effective communicative expression, is socially situated and socially constituted (Duhamel, 1949; Ehninger, 1968), reflecting prevailing views of the nature of language, of thought and learning, and of social relationships.

Let me turn briefly to an earlier "literacy crisis" in the hope of illustrating the complexity of those relationships and the limits of current popular and legislative demands for a return to the so-called basics. The period from about 1880 to the turn of the century was marked by major national debates over a so-called literacy crisis. It was a time of rapid economic change as American society moved from an earlier entrepreneurial base to a bureaucratic industrial order with vastly increasing need for a white-collar work force armed with a measure of literacy beyond the level achieved by the old common schools (Trow, 1961). Moreover, it was a period of deep-cutting social and linguistic tensions as mounting numbers of an immigrant proletariat crowded into American cities in whose schools it was said: "Good English is a dead letter and each child uses his bastard speech unhindered and unafraid" (Searing, 1898, p. 245). By the end of the period, no less a figure than Henry James would conclude that the American language was threatened by reason of its having been "handed over . . . to the American Dutchman and Dago . . . divested of native atmosphere and circumstance" (1905, pp. 40-41). It was in this period, with growing economic demand for a technical standard of literacy joined to widespread linguistic fear, that the school subject of English emerged in the high school. Throughout these decades, schoolmen insisted that the aims of the subject were practical, defined "by merchants and professional men" (Groce, 1892, p. 332), calculated to meet the business demands of life (Aiton, 1897, p. 151) and to ensure that graduates of the high schools became the "real guardians of correct speech" (Godkin, 1897, p. 6). In the face of gut linguistic fear, the high schools and colleges were charged with responsibility for establishing a formal standard of usage, a standard which could provide a model as well as a badge of class for its users. A popular journal of the day reported that no issue was more imperative in a country "lacking a class which serves as example" ("Correct Speech," 1894, p. 240). By the turn of the century, linguistic propriety had been intimately linked with civic responsibility and morality. "Slipshod spelling," it was observed, "rose from slipshod thinking which rose from inadequate moral ideals" (Miller, 1900, p. 287).

Accordingly, and particularly as it embraced the teaching of writing, the subject of English emerged as essentially remediative, attaching priority to pruning the student's diction, to "making English style a subject of teaching without involving the subject matter under discussion" (Bain, 1901, p. 48). Dissolving its ties with the ancient study of rhetoric and its accumulated lore, the composition curriculum which emerged was narrowed to fit the limits of an abstract standard of linguistic correctness, rules for the formation of logical paragraphs, the placement of topic sentences and rules for achieving coherence within a set of forms of discourse whose origins rested firmly in the faculty psychology of the eighteenth century (cf. Douglas, 1974; Kitzhaber, 1953; Ohmann, 1976; Piché, 1977). Divorced from any process of inquiry, from any of the social contingencies affecting communicative conduct, it came to be based on pupil practice and little more. By the turn of the century, the Pedagogical Section of the Modern Language Association reported the subject as not fit for advanced study and research (Buck, 1901).

Thus, for a century, the achievement of literacy in writing has been conceded to the lower schools as a relatively simple, practical, and essentially economically enabling set of skills. Here it has remained, supported by only the most limited kinds of research--a closed subject, devoid of any intellectual cutting edge. In a major review of research in written composition which appeared over a decade ago, the editors concluded that "taken as a whole, research in composition might be compared to chemical research as it emerged from the period of alchemy" (Braddock, Lloyd-Jones, & Schoer, 1963, p. 5). In his review of the teaching of writing in college, Kitzhaber (1963) observed that traditional instruction in writing was based on "a desiccated rhetorical doctrine that has probably done a good deal more over the years to hinder good writing than to foster it" (p. 16).

This is not to say that the limits of our theory, our attention, and our practice derive principally from teachers of English. In spite of those limits, gifted teachers continue to apply our inherited lore, imparting skill and regard for writing. Unfortunately, they are supported only by the most limited kinds of theory and research, by the most limited kinds of social and intellectual investment.

One can only speculate as to the limits of our investment and inventiveness in this area. There are those avowedly elitist critics who see the level of mass literacy produced by universal education as a kind of industrial pollutant and who claim that the level of literacy which can be effectively achieved in such societies is sufficient only for the total control of their populations (Blackmur, 1955). Others--critical philosophers and sociologists among them--define unequal social class distribution of educationally profitable linguistic capital as responsible for the maintenance of the relationships between social origin and scholastic achievement. Traditional norms or standards of literacy are culturally arbitrary and are, from this view, imposed by a dominant class, functioning to maintain structural inequalities (cf. Bourdieu & Passeron, 1977; Habermas, 1970).

I believe that interpretations such as these cannot be rejected out of hand. They are not in each case the product of a simple conspiratorial view, a view of conscious, malevolent actors and groups, but represent considered attempts to discover the social dynamics underlying the drift--out of social consciousness--of a society's investment of its linguistic capital. It is not my point to make a case for any particular interpretation. Instead, these are cited as examples of a kind of scholarship which we have in very limited supply. Wherever it is that we are going to go in the framing and rationalizing of policy, one might wish that the effort could be more deliberately informed by a fully developed sociology of literacy. Somewhat similarly--

and as compared to ongoing attempts at functional assessments of reading ability--we have only the dimmest view of the functional requirements attaching to the act of writing in our own society. Beyond concern for the internal structure of written language, we need to inquire about the social and cultural factors that influence the ways in which writing actually is used, the conditions under which it is elected, and the purposes to which it is put in relation to other available channels or modes of communication (Basso, 1974).

Let me summarize. We face major problems in defining and seeking social sanction for the development of policy and procedures to improve the reading and writing skills of our children. I do not believe that the widely reported declines in test scores tell us much about the nature of the problem but are instead symptomatic of fundamental issues of long standing in our schools and in our society. Embracing a concept of literacy as a relatively well defined social commodity (as Professors Bormuth and Venezky have pointed out), I have argued that the relations between society and culture and norms or standards of communicative conduct are close, if little understood. I have expressed a hope that badly needed research related to procedures for improving reading and writing performance be supported and informed by broader gauged sociological and critical studies, presuming such studies to be useful in making choices to guide our research and our instruction and the institutional arrangements by which both are supported.

My synopsis has become elaborate. My prognosis will be brief, pointing to certain major conclusions or implications developing from this conference--conclusions which, if acted upon, may shape the directions we take.

The first has to do with a point which has been forcibly made. That point is that power and control over language develop as a result of practice in its use. Understanding it depends on a careful distinction between knowing that and knowing how (Ryle, 1949), a distinction which is important in understanding how it is that we learn or master any skilled performance. The skilled performance of writing, like playing tennis or playing the piano or riding a bicycle, is an ensemble performance which requires repeated practice in knowing how. By contrast, instruction in formal grammar leads toward knowing that something about language is the case. Whatever its alternative, such instruction bears little relation to actually knowing how to produce skilled performances in either speaking or writing. Our persistence in emphasizing this kind of formal knowing *that* in presumed service to learning how to speak and write is related to the limited and essentially remediative rationale which we have inherited and which continues to guide much of our effort in the teaching of writing (cf. Western, 1977).

Here it is important to observe that the most recent preliminary reports of the second round of the national assessment of writing conclude that major deficiencies in student writing were not in the area of so-called mechanics. Rather, the deficiencies were the result of the fact that the ideas expressed by many of the writers offered little evidence of independent thought or perception (National Assessment of Educational Progress, 1975). Accordingly, it does not appear that the problem rests in putting pen to paper to form words or sentences. It rests somehow in the process of thinking itself. I take the evidence here to pose the greatest challenge--a challenge to go beyond an inherited view of writing as a kind of limited, practical skill--to a view of writing as one of the most powerful and significant things, along with reading, that children learn in school. That is to say, it has a *developmental role* which transcends the actual use to which it may be put at some later date. The fact is that "the talk by which children will govern their lives will require mental abilities that will best be developed by the practice of writing" (Britton, Burgess, Martin, McLeod, & Rosen, 1975, p. 201). Bruner (1975) proposes a concept of *analytic competence* designating a stage beyond linguistic competence, a stage "accompanied by strategies of thought and problem solving appropriate not to direct experience with objects and events but with ensembles of propositions" (p. 72) and concludes that practice in writing may foster that competence. From this perspective, "the teaching of English . . . may well be teaching the calculus of thought as well" (Bruner, 1966, p. 105).

Functionalist accounts of the uses of writing analogous to those being used to estimate reading literacy can and should be useful in the design of more effective, more culturally normal strategies for defining purpose in students' writing. But if Bruner and the others are right, it is the underlying process itself which represents a major psychological potential of schooling. It is that view of writing, I believe, which needs to be placed fairly in view alongside some of our more recently altered notions of what schooling is and what it is about. In doing so, we may encounter some suspicion that we have overreacted, that we have confused objectives of personalism and social nerve with the development of fundamental cognitive-linguistic abilities. Acting on this revised estimate of what it means to learn to write, what it means to teach writing, we may be able to overcome some of the inertia of tradition. We may be able to begin to ask fundamental questions about relative emphases in the curricular space which is available. Accepting the important effect of reading skills on writing, we may be led to ask new and better questions about the potentially profound impact of writing on reading itself (cf. Richards, 1942; Stotsky, 1975). As long as writing is only an instrumental skill, bounded by socially cosmetic notions of what is correct and occupying a curricular poor-relation status in our schools and colleges, we will make little progress. A fundamental revision of our collective view of what is involved is a prior necessity.

Attending to the developmental significance of the schools' literacy programs, particularly in writing, we may seek to devise communicative tasks more appropriately within the range of children's experience and knowledge of the world. Employing strategies such as those employed in studies of children's developing referential accuracy skills, we may invest both the teaching of speaking and writing with new purpose at the same time that we improve our ability to measure such performances in terms other than teacher judgment (cf. Higgins, 1973; Krauss & Glucksberg, 1969). Serious attention to developmental perspectives invites the construction of curricula which are perceptually less barren, curricula which provide opportunities for children to move back and forth between speaking and writing, playing up and down the symbolic scale from personal and expressive communication to description and reporting, to theorizing, arguing and speculating, constantly modulating and orchestrating purpose, persona, and intended audience. To know what is intended and the distance to be traveled, we might observe the results of a major British study of children's development of writing abilities between the ages of 11 and 18. The study reveals what can only appear as a disproportionate emphasis in all school subjects on a particular mode of informative or expository writing with a teacher-examiner as the main audience (Britton et al., 1975). Lacking any comparable study of writing in American schools, we may only guess at curricular similarities. For a number of reasons, I would judge them to be high. The point is that if the development of writing ability is genuinely to reflect a growing range of thinking processes, it might be expected to embrace a greater and more realistic range of both purpose and audience. Clearly, we have much more to learn regarding these matters, but there is some limited evidence that in the manipulation of syntactic structures, differences in mode and intended audience for writing account for a range of variation up to and beyond 4 years of average development (Crowhurst, 1977).

To rehearse some of these conclusions--speculating on where it is that we may be going--is to be struck again by certain limits of present curricular arrangements in our schools and in our colleges. I believe this to be true particularly in the training of teachers of English. At least as it exists in the schools, the study of English is under major public reexamination. Growing demands for accountability will continue to press for answers to questions of educational priorities. In answer to those questions, I believe that the school subject of English will have to accept the teaching of reading and writing as its major areas of work. If it does--and I believe it will--those of us in colleges and universities will need to reexamine old assumptions marking our divisions between content and process, between subject and method, laying many of them aside as we seek a redefinition of our work that is radically interdisciplinary. Some of the pride of place presently occupied by literary critical studies will, I believe, give way to developmental studies of cognition, of language, of linguistics, of rhetoric and communication, and of reading processes and pedagogy, as well as qualitatively and quantitatively more deliberate study and research about writing and the teaching of writing. Such revisions in the undergraduate preparation of teachers of English (teachers of reading and writing and speaking) may lead to new emphases in graduate education as well, as the profession asserts new responsibility for teaching and research premised on achieving improved standards of literacy.

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